



Final – June 16, 2026

# 2025 Urban Water Management Plan



Prepared By:



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This 2025 Urban Water Management Plan was prepared under the direction of a California licensed civil engineer.



# EXECUTIVE SUMMARY

## LAYPERSON'S DESCRIPTION

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The devastating drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA). The UWMPA requires urban water suppliers serving over 3,000 customers or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan every five years, and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon. The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan. And last, beginning in July 2022, each urban water supplier must prepare an annual water supply and demand assessment. The California Legislature asserts that aggregating all of these legal requirements at the urban water supplier level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the Urban Water Management Plan (UWMP) is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP will provide the supplier's elected officials, management, staff, and customers with an understanding of past, current, and future water conditions and management. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects as well as providing for statewide challenges that may manifest through climate change and evolving regulations. Thoughtful urban water management planning provides an opportunity for the supplier to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

### ES-1 ELK GROVE WATER DISTRICT

The Elk Grove Water District (District) is a public water agency that provides potable water directly to retail customers throughout the approximately 13 square mile service area boundary. The District, originally created in 1893 to provide local water services and fire protection water resources, has continued to be a predominant water purveyor within the

## Executive Summary

City of Elk Grove. Formerly called Elk Grove Water Works, it was family owned until 1999 when it was purchased by the Florin Resources Conservation District (FRCD). The District's services are coordinated and managed within the FRCD, and it is governed by a five member, publicly elected Board of Directors.

Serving a population of nearly 45,000, the District has a broad range of responsibilities, including long-term water reliability planning, management of current groundwater assets, and distribution of potable water.

The District is separated into two service areas: Service Area 1 and Service Area 2. Service Area 1 is supplied by groundwater wells and treated by the District's water treatment plant. Service Area 2 is supplied by surface water and groundwater purchased from SCWA. **Figure ES-1** represents EGWD's service areas.

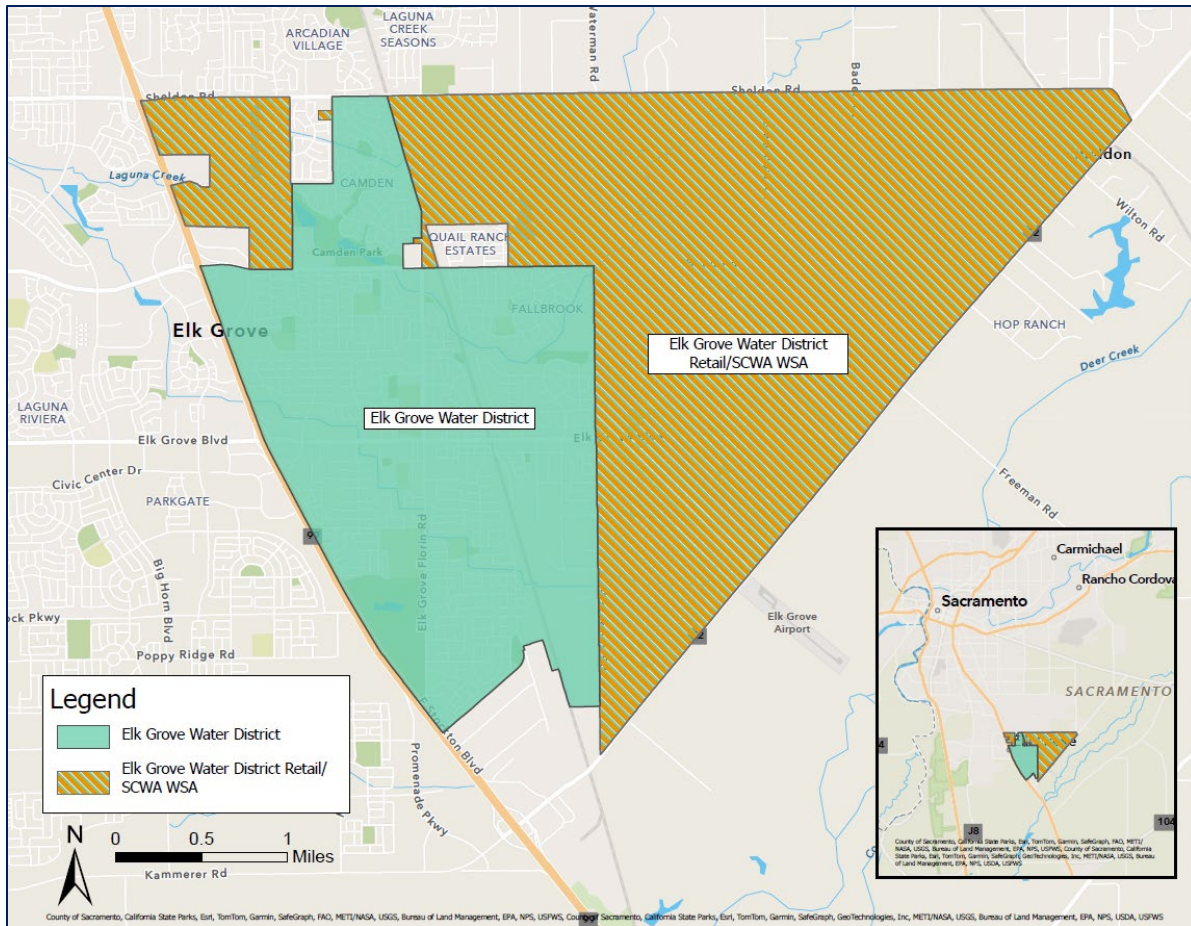


Figure ES-1. ELK GROVE DISTRICT WATER SERVICE AREA

## ES-2 WATER SERVICE RELIABILITY

Elk Grove Water District has developed a robust water supply portfolio to serve its current and future demands. The District derives its water supplies from two sources – groundwater from the South American Subbasin and contract supplies through an agreement with Sacramento County Water Agency. The District’s groundwater supplies are linked to a number of historical groundwater management actions, including formation of the Sacramento Central Groundwater Authority (SCGA) and more recently the development of the SCGA Groundwater Sustainability Agency (GSA) under the Sustainable Groundwater Management Act (SGMA). SCGA prepared the original groundwater management framework that has been included in the District’s 2025 Urban Water Management Plan. SCGA’s ongoing water management activities have stabilized the South American Subbasin’s groundwater levels and helped preserve the District’s access to those supplies for future generations.

SCGA GSA is updating the existing groundwater management plans, in cooperation with four other GSA’s, to ensure that the South American Subbasin meets the SGMA sustainability objectives. The South American Subbasin Groundwater Sustainability Plan (GSP) will be completed in 2022 and will characterize and develop specific actions that meet the SGMA sustainability objectives. And although the new GSP may alter how and under what conditions the District may access groundwater supplies from the South American Subbasin, the District does not anticipate any actions that would reduce long-term reliability of the groundwater to meet its current and future demands.

The District also has a Master Water Agreement with Sacramento County Water Agency (SCWA) that it signed in 1995 and renewed in 2002 (Agreement). This Agreement obligates SCWA to provide water supplies to the District’s service area. The Agreement has a fifty-year term and a right of renewal that stabilizes the long-term reliability of this supply to meet the District’s current and future demands. Moreover, SCWA may deliver any of its water supplies – both surface water and groundwater – based on the terms of the Agreement, giving the District added reliability through SCWA’s diverse water supply portfolio and conjunctive use actions. Taken together, the District’s groundwater supplies and Agreement provide reliable supplies to meet the District’s normal, single dry, and five-consecutive dry year water supply needs through 2050.

# CHAPTER 1

## INTRODUCTION

The Elk Grove Water District (EGWD or District) has served as a cornerstone of water supply and management in southern Sacramento County for more than 130 years. Originally established in 1893 as the Elk Grove Water Works to provide local water service and fire protection, the utility has evolved alongside the community it serves. After more than a century of family ownership, the District was acquired by the Florin Resources Conservation District (FRCD) in 1999. Today, EGWD operates as a subsidiary of the FRCD, governed by a publicly elected five-member Board of Directors.

EGWD provides reliable, high-quality drinking water to a population of more than 44,000 residents, as well as to a range of Commercial, Institutional, and Industrial (CII) customers. The District's responsibilities include maintaining and operating the potable water distribution system, managing groundwater resources, and planning for long-term water supply reliability.

Today, EGWD continues to build on its legacy of service by investing in infrastructure, planning for long-term reliability, and prioritizing customer needs. With a mission grounded in safety, dependability, and sustainability, the 2025 Urban Water Management Plan (UWMP) reflects both the District's historic commitment to water stewardship and its forward-looking approach to ensuring a resilient water future for generations to come.

### 1.1. BACKGROUND AND PURPOSE

The Urban Water Management Planning Act (UWMPA) was enacted by the California Legislature in 1983 to address the growing need for comprehensive water supply planning across the state's urban areas. Codified in California Water Code (CWC) §§10610-10656, the UWMPA requires urban water suppliers serving more than 3,000 customers or delivering more than 3,000 acre-feet annually to prepare and adopt comprehensive water management plans every five years. The District has prepared this 2025 UWMP to comply with the UWMPA requirements and addresses the District's water management planning efforts to assure adequate water supplies to meet forecast demands over the next 25 years.

As required by the UWMPA, this 2025 UWMP specifically assesses the availability of the District's supplies to meet forecast water uses during average, single-dry, and five consecutive drought years through 2050. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry-year conditions are critical outcomes of this plan. The 2025 UWMP is an update to the District's 2020 UWMP and presents new data and analysis as required by the California Department of Water Resources (DWR) and the

CWC since 2020. This comprehensive water planning document describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use.

The UWMP is designed to be a valuable water management and planning tool to guide and inform the District’s managers, customers, and the State of California about the District’s water management practices. It reflects the District’s planning assumptions and goals and should be used in combination with other planning resources and documents over the UWMP planning horizon, representing the District’s continued commitment to responsible water stewardship and proactive strategies that protect both water reliability and community prosperity.

## 1.2. BASIS FOR PLAN PREPARATION

The District operates a Public Water System as described in California Health and Safety Code §116275. The District qualifies as a Retail Urban Water Supplier as described in CWC §10617, providing water for municipal purposes to more than 3,000 customers or 3,000 acre-feet of water per year. This qualification requires the preparation of an Urban Water Management Plan every five years.

The District’s Public Water System details are listed in **Table 1-1**.

**TABLE 1-1. PUBLIC WATER SYSTEM INFORMATION**

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025
CA3410008	Elk Grove Water District	13,229

The State Legislature passed numerous new requirements for the 2020 UWMP cycle which continue to apply to this 2025 UWMP. Since there have been no additional statutory changes to UWMP requirements between 2020 and 2025, this plan incorporates the same comprehensive framework established for 2020 UWMPs. Major requirements implemented in 2020 and continued in this 2025 UWMP are listed below along with references to the corresponding sections where they are addressed in this document.

**Five Consecutive Dry-Year Water Reliability Assessment:** The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires the District to analyze the reliability of its water supplies to meet its water use over an extended drought period. This requirement is addressed in Chapter 3—Water Supply Characterization, Chapter 4—Water Use, and Chapter 5—Water System Reliability.

**Drought Risk Assessment (DRA):** Due to the extensiveness of recent California droughts and the variability associated with climate change predictions, the California Legislature created

a DRA requirement for UWMPs. The DRA requires assessment over a five-year period from 2026 to 2030 that examines water supplies, water uses, and the resulting water supply reliability for five consecutive dry years. The DRA is addressed in Chapter 5—Water System Reliability and Chapter 6—Water Shortage Contingency Plan.

**Seismic Risk:** Evaluating seismic risk to water system infrastructure and facilities and having a mitigation plan is now required by the CWC. Incorporating the water system into regional or county hazard mitigation planning is an important aspect of this statute. Seismic risk is addressed in Chapter 6—Water Shortage Contingency Plan.

**Water Shortage Contingency Plan:** The Legislature modified the UWMPA to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides the District with an action plan for a drought or catastrophic water supply shortage. The WSCP is included in Chapter 6 of this UWMP.

**Groundwater Supplies Coordination:** UWMPs are required to be consistent with Groundwater Sustainability Plans following the 2014 Legislature enactment of the Sustainable Groundwater Management Act (SGMA). The District’s groundwater supplies are described in Chapter 3—Water Supply Characterization.

**Lay Description:** A synopsis of the fundamental determinations of the UWMP is a statutory requirement. This section is intended for new staff, new governing members, customers, and the media, and ensures a consistent representation of the District’s detailed analysis.

### 1.3. COORDINATION AND OUTREACH

The District has complied with the UWMPA by engaging in coordination with local and regional agencies to ensure a consistent, transparent, and regionally integrated approach to water resource planning. Coordination and communication among agencies play a critical role in promoting reliability, resilience, and sustainability of the region’s water supplies. In accordance with CWC §10620(d)(3), the District coordinated the preparation of this UWMP with other appropriate agencies within and adjacent to its service area, including water suppliers sharing common sources, water management agencies, and relevant public entities.

The District actively participates in regional coordination efforts as a member of both the Regional Water Authority (RWA) and the Sacramento Central Groundwater Authority (SCGA). The RWA includes most of the region’s water agencies and focuses on regional water-supply planning, program development, and representation on statewide water issues. The SCGA is charged with managing and monitoring the Sacramento region’s groundwater basin to ensure its long-term sustainability. Coordination with these regional partners ensures consistency between this UWMP and related planning documents such as Groundwater Sustainability Plans (GSPs), General Plans, and Water Master Plans. These efforts strengthen integrated regional water management and support alignment with other regional and state planning initiatives.

In compliance with CWC §10621(b), the District provided notification to all affected cities and counties at least 60 days prior to the public hearing on this UWMP update, ensuring adequate opportunity for review and participation. Additionally, the District conducted outreach to community stakeholders and encouraged the involvement of diverse social, cultural, and economic elements within the service area, as required under CWC §10642. These efforts reflect the District’s ongoing commitment to public transparency and engagement in water resource planning. A summary of these notifications is provided in **Table 1-2**.

**TABLE 1-2. PUBLIC AND AGENCY COORDINATION**

Coordinating Agencies	Coordinate Activity
<b>Cities, Counties, Customers, and Interested Parties</b>	
City of Elk Grove (Planning Dept.)	60-Day Notice, Notice of Public Hearing, Copy of Draft UWMP
City of Elk Grove (Public Works Dept.)	60-Day Notice, Notice of Public Hearing, Copy of Draft UWMP
Consumnes CSD	Notice of Public Hearing, Copy of Draft UWMP
Sacramento County	60-Day Notice, Notice of Public Hearing Copy of Draft UWMP
Sacramento County Water Agency	Coordinated Regarding Demands, 60-Day Notice, Notice of Public Hearing, Copy of Draft UWMP
Sacramento County Regional Sanitation District	Notice of Public Hearing, Copy of Draft UWMP
General Public	Notice of Public Hearing, Copy of Draft UWMP
<b>Shared Groundwater Resource Interests</b>	
Cal-Am Water Company	Notice of Public Hearing, Copy of Draft UWMP
Sloughhouse RCD	Notice of Public Hearing, Copy of Draft UWMP
Golden State Water Company	Notice of Public Hearing, Copy of Draft UWMP
Rancho Murrieta CSD	Notice of Public Hearing, Copy of Draft UWMP
Omochumne Hartnell WD	Notice of Public Hearing, Copy of Draft UWMP

### 1.3.1. WATER SUPPLIER INFORMATION EXCHANGE

In accordance with CWC §10631(h), the District coordinated closely with its wholesale water supplier, Sacramento County Water Agency (SCWA), to exchange data and projections necessary for both agencies' UWMPs. The District's service area is completely encompassed by SCWA, and as required by the UWMPA, both agencies exchange projected water demand in five-year increments for at least 20 years into the future. Due to its contractual and geographical relationship, SCWA plays a role in the District's water management of Service Area 2.

### 1.3.2. STATUTORY REQUIREMENTS FOR NOTICE

The District notified the City of Elk Grove and Sacramento County regarding its intent to update and adopt this 2025 UWMP. Furthermore, consistent with CWC §10642, the District encouraged public participation by providing notice of the hearing date, time, location, and methods for accessing the draft UWMP. Notifications were published in local newspapers and sent directly to interested stakeholders to promote inclusive community involvement in the plan's development.

## 1.4. PUBLIC HEARING, ADOPTION, AND SUBMITTAL

In compliance with CWC §10642, the District held a publicly noticed hearing on May 19, 2026 to review the 2025 UWMP and associated WSCP. The hearing provided an opportunity for community members and regional stakeholders to comment on the proposed Plan. Following public input, the Board of Directors formally adopted the 2025 UWMP and WSCP by resolution on June 16, 2026.

Consistent with CWC §10644(a), the adopted Plan was submitted within 30 days to the California State Library, the City of Elk Grove, and the County of Sacramento. Additionally, the District electronically submitted the Plan and all required data tables to the DWR prior to the regulatory deadline of July 1, 2026, completing all statutory submittal obligations.

## 1.5. DOCUMENT ORGANIZATION

This 2025 UWMP is organized as follows:

- **Executive Summary** provides an overview of the purpose and findings of this 2025 UWMP.
- **Chapter 1** establishes the basis for the UWMP, describes the outreach activities and introduces the document organization.
- **Chapter 2** provides a description of the District's service area, demographic characteristics and climate, and describes the future population the District anticipates needing to serve.
- **Chapter 3** describes the current and future water supplies and the availability of the supplies through 2050.

## Chapter 1 – Introduction

- **Chapter 4** details the customer uses, including the past and future estimated uses, and describes District's past and on-going demand management measures.
- **Chapter 5** presents the District's water system service reliability into the future, including an assessment of reliability if a drought occurred over the next five consecutive years.
- **Chapter 6** is the District's stand-alone water shortage contingency plan, incorporated as a chapter in this UWMP, but also available to be shared and utilized separately from the UWMP.

**NOTE TO DWR:**

The Elk Grove Water District has prepared this Urban Water Management Plan (UWMP) primarily as a water resource planning tool to effectively manage water supply, reliability and demand. This UWMP also satisfies all the requirements of the Urban Water Management Planning Act (UWMPA).

The body of the document provides narratives, analysis and data that DWR requests in its 2025 UWMP Guidebook, including changes to the California Water Code since 2020. Efforts have also been made to include enhancements to this document wherever possible as recommended in the UWMP Guidebook.

Unless otherwise noted, annual reporting is on a calendar year basis and units for volumetric values are reported in acre-feet.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2025 UWMP Guidebook. These tables are separately uploaded to DWR’s web portal. This UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F in the 2025 UWMP Guidebook.

# CHAPTER 2

## WATER SERVICE AND SYSTEM DESCRIPTION

EGWD, as a department of the Florin Resource Conservation District, provides potable water service to retail customers within an approximately 13-square-mile area located in the City of Elk Grove, south of Sacramento. The District’s service area is generally bound by Sheldon Road to the north, Highway 99 to the west, Grant Line Road to the east, and the Union Industrial Park to the south. The District is entirely surrounded by SCWA.

### 2.1. WATER SERVICE AREA

The District is separated into two service areas: Service Area 1 and Service Area 2. Service Area 1 (denoted on **Figure 2-1** as “Elk Grove Water District”) is supplied by groundwater wells and treated by the District’s water treatment plant. Service Area 2 (denoted on **Figure 2-1** as “Elk Grove Water District Retail/SCWA WSA”) is supplied by surface water and groundwater purchased from SCWA. **Figure 2-1** represents EGWD’s service areas.

The District provides water service to approximately 13,200 residential, commercial and institutional, irrigation, and industrial service connections. Much of the development is low and medium density single-family housing, with accompanying retail commercial use. **Table 2-1** provides the historical and current number of service connections by customer class for the entire District.

**TABLE 2-1. CUSTOMER WATER SERVICE CONNECTIONS**

Customer Class	2020	2021	2022	2023	2024	2025
Single Family Residential	12,295	12,297	12,311	12,384	12,459	12,585
Multi-Family Residential	62	62	62	61	61	59
Commercial/Institutional	361	362	382	388	388	372
Industrial	43	43	41	41	41	40
Landscape Irrigation	121	134	137	146	149	173
<b>Total</b>	<b>12,882</b>	<b>12,898</b>	<b>12,933</b>	<b>13,020</b>	<b>13,098</b>	<b>13,229</b>

## 2.2. SERVICE AREA CLIMATE

The District’s climate is typical of California’s Central Valley with hot, dry summers, and cool, wet winters. Climate data was derived from local reporting stations with the same microclimate characteristics as the District’s service area.

Temperature data was obtained from the PRISM Climate Group for the Elk Grove area<sup>1</sup>. The average temperature is about 61 degrees Fahrenheit (°F). Typically, July and August are the hottest months of the year with an average daily temperature of about 75 °F, though daytime high temperatures average between 92–93 °F. December and January are generally the coolest months of the year, with a mean annual temperature of about 47 °F, and the average minimum dipping down to 38 °F.

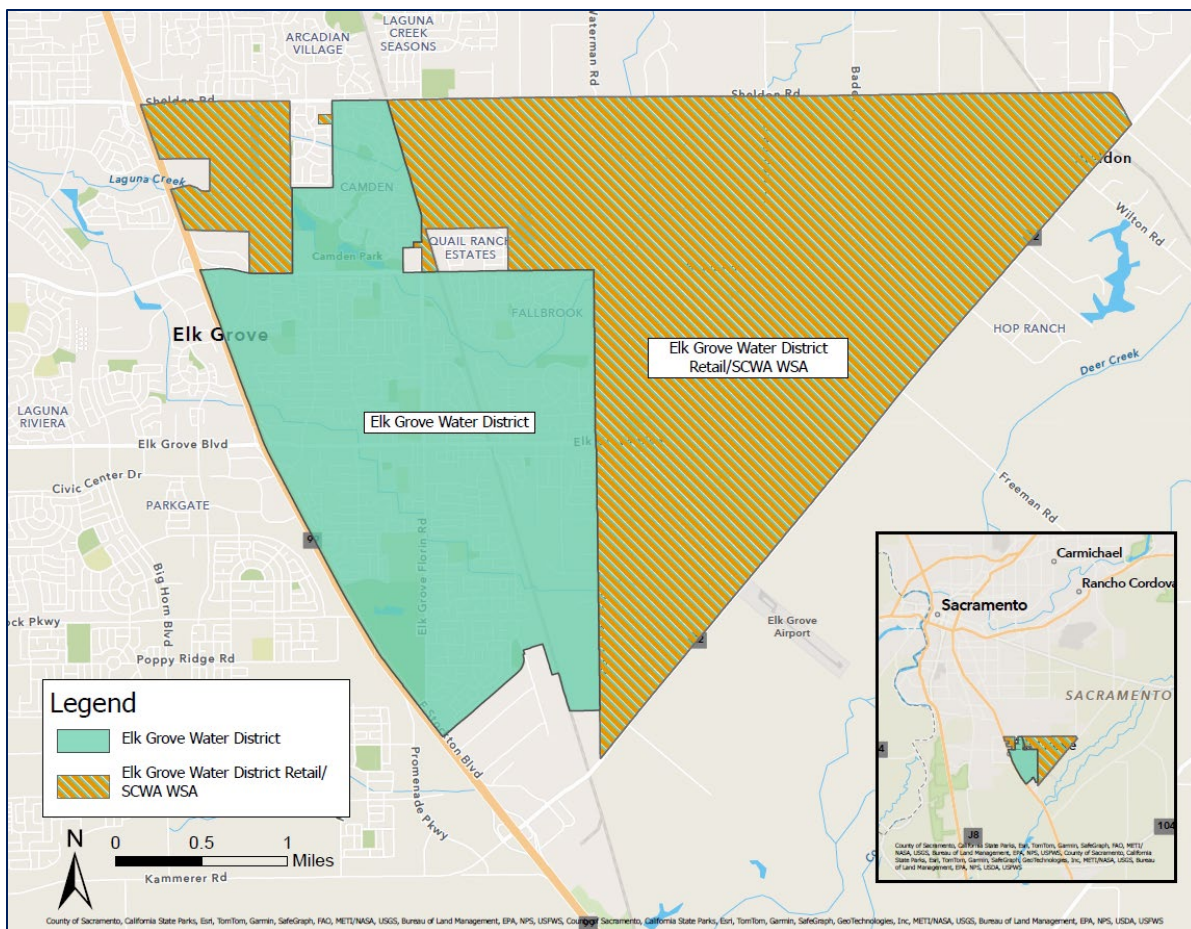


FIGURE 2-1. WATER SERVICE AREA

<sup>1</sup> <https://prism.oregonstate.edu/> Location: Lat: 38.4074 Lon: -121.3674 Elev: 49ft.

Precipitation data is also documented from the PRISM Climate Group. For the 1995 to 2025 period, average rainfall was measured at about 18.5 inches. The wettest months are December, January, February, and March while the driest months are typically July and August.

Evapotranspiration (ETo) varies seasonally, and during dry years the significance of evapotranspiration is magnified because it continues to deplete surface and soil water supplies that are not being replenished by sufficient precipitation. EGWD monitors ETo closely. Standard monthly average ETo data was obtained from the California Irrigation Management Information System (CIMIS) Station 131 located in Fair Oaks, California, which is about 20 miles northeast of the service area. Average annual ETo for the period 1997–2025 measured 51.11 inches.

ETo, rainfall, and temperature data is provided in **Figure 2-2**.

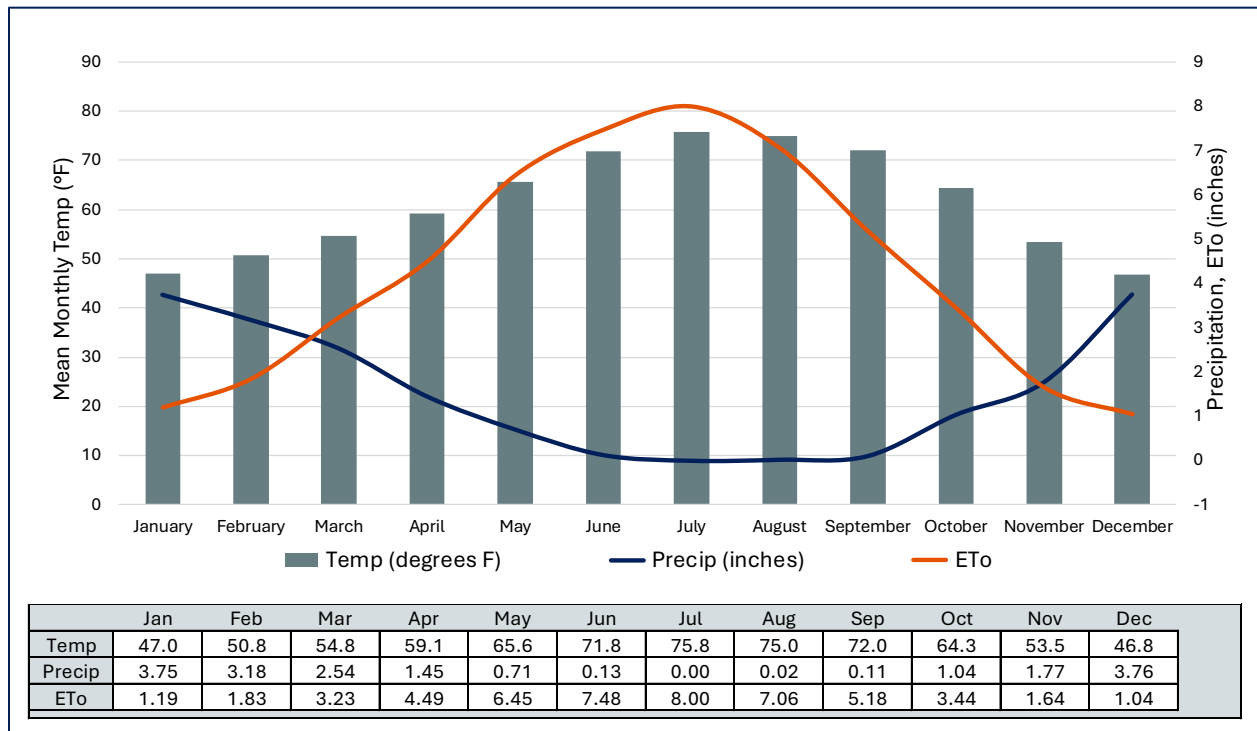


FIGURE 2-2. AVERAGE CLIMATE CONDITIONS<sup>2</sup>

### 2.2.1. CLIMATE CHANGE

While the CWC does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to

<sup>2</sup> Temperature and precipitation data represents averages from 1995–2025 from the PRISM Climate Group; ETo data is from CIMIS – Fair Oaks Station 131, Apr 1997–Dec 2025.

consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply—both in a historical and projected context.

The service area climate is highly variable with respect to precipitation and temperature. The dry summer months make the state extremely susceptible to drought when a deficiency in precipitation materializes, especially in mountain snowpack. Much of the water supply comes from the mountains falling as winter rain or snow and is then stored as snowpack and subsequently captured in reservoirs and appropriated throughout the year.

As a member of the Regional Water Authority (RWA), the District participated in the American River Basin Study. Per DWR requirements regarding the inclusion of climate change analysis, pertinent excerpts from the referenced study are presented below.

### AMERICAN RIVER BASIN STUDY

In 2020, the American River Basin (Basin) region conducted a climate change study in partnership with local water purveyors and the United States Bureau of Reclamation (USBR). The purpose of the American River Basin Study (ARBS or Study) was to develop data tools and analyses, identify supply-demand imbalances, and climate change adaptation strategies specific to the Basin. Under the “new normal” of a changing climate, the ARBS aims to improve the resolution of regional climate change data and to develop regionally-specific mitigation and adaptation strategies. More detail, along with the approved study can be found at [www.pcwa.net/planning/arbs](http://www.pcwa.net/planning/arbs).

The Study Area is bounded by the Sierra Nevada mountain range to the east, the Feather and Sacramento Rivers to the west, the Bear River to the north, and the Cosumnes River to the south. In addition to the American River Watershed, the Study Area encompasses the North and South American Groundwater Sub-basins, and Non-Federal Partners’ service areas outside of the American River Watershed.

### PROJECTED FUTURE CONDITIONS

Analysis of projected future climate conditions in the American River Basin and development of climate scenarios for the ARBS were based on an ensemble of bias-corrected and spatially downscaled climate projections.<sup>3</sup> This ensemble has been used by the California Water Commission and DWR as the primary source of climate projection information in several recent studies, including the Water Storage Investment Program (WSIP) and California’s

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<sup>3</sup>Climate projections were developed using Global Climate Models from the Coupled Model Intercomparison Project Phase 5 (CMIP5) and downscaled using Localized Constructed Analogs (LOCA) method projected and coupled with two future emission scenarios (RCP 4.5 and RCP 8.5) available from Dr. David Pierce at the Scripps Institution of Oceanography.

Fourth Climate Change Assessment.<sup>4</sup> Projected future climate conditions were evaluated and characterized based on the ensemble of downscaled climate projections.

Hydrology scenarios were used to develop streamflow inputs to CalSim 3.0, which was then used to evaluate changes in water supplies, demands, and management throughout the Central Valley Project (CVP) and State Water Project (SWP), including the Study Area. Demands for each water purveyor largely relied upon water purveyors' information provided in Regional Drought Contingency Plan/Regional Water Reliability Plan<sup>5</sup> and 2015 UWMPs.

### TEMPERATURE

Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century, and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum temperatures projected to increase as much as 7.3°F during the summer months.

### PRECIPITATION

Annual precipitation projections show no significant trend in the median of change over the 21st century. Many of the available general circulation model (GCM) projections show change in precipitation, but there is no consistency in the magnitude and direction of projected change between models. Approximately half of the projections indicate a minor increase in annual precipitation and half indicate a minor decrease, highlighting the large uncertainty in future precipitation over this region. Although lacking a clear trend in projected annual precipitation, by the end of the 21<sup>st</sup> century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation. **Table 2-2** displays the projected (2070-2099) change in precipitation and temperature compared to 1980-2009 averages.

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<sup>4</sup> Pierce, D. W., J. F. Kalansky, D. R. Cayan. Climate, Drought and Sea Level Rise Scenarios for California's Fourth Climate Change Assessment. August 2018.

<sup>5</sup> Regional Water Authority (RWA). North American Basin Regional Drought Contingency Plan, October 2017 and Regional Water Reliability Plan, May 2019.

**TABLE 2-2. PROJECTED CHANGE IN PRECIPITATION AND TEMPERATURE OVER THE AMERICAN RIVER BASIN STUDY AREA BETWEEN 1980-2009 AND 2070-2099**

Season	Percent Change in Basin-Averaged Annual Mean Precipitation (%)	Change in Basin-Averaged Annual Mean Daily Air Temperature (°F)	Change in Annual Mean of Daily Maximum Air Temperature (°F)	Change in Annual Mean of Daily Minimum Air Temperature (°F)
Fall	-6.0	5.8	6.2	5.5
Winter	4.7	4.9	5.0	4.8
Spring	-11.9	5.8	6.3	5.1
Summer	10.4	7.2	7.3	7.0

**SNOWPACK**

Snow water equivalent (SWE) is a key indicator of water supplies in this region, where runoff is largely influenced by snowmelt. The increasing variability in precipitation combined with increases in surface air temperatures are key drivers in projections of a reduction in annual average SWE. Average SWE is forecasted to decrease by 50–85% across all climate scenarios and future time periods. In addition, areas that accumulate snow above Folsom Reservoir are also projected to have up to a 12-inch decrease in maximum snowpack by end of the century.

**EVAPOTRANSPIRATION**

Potential evapotranspiration (PET) serves as a key indicator of landscape and agricultural water demands, including consumptive use by evaporation and transpiration from bare soil, water surfaces, native vegetation, and crops. Average annual PET is expected to increase 1.2 to 6.2 inches across all climate scenarios and future time periods. PET is strongly correlated with air temperature and thus expected to increase more under the hot scenarios (hot-dry, hot-wet) than under the warm scenarios (warm-dry, warm-wet).

**RUNOFF**

Watershed runoff is a direct indicator of available local water supply and is used to determine water availability for the State Water Project and Central Valley Project. Climate change projections indicate a pronounced shift in the distribution of runoff from May and June to earlier in the season (December to March), implying a transition in precipitation from snow to rainfall and/or earlier snowmelt and increasing the amount of runoff during the winter months. Peak runoff is expected to shift by more than a month earlier by mid to late century (**Figure 2-3**). Spring runoff will decrease due to reduced winter snowpack. Similar to the precipitation scenarios, there is large uncertainty in projected runoff where the ‘wet’ scenarios suggest an increase in annual runoff and the ‘dry’ scenarios suggest a decrease in annual runoff. The projected changes in basin wide runoff range from an increase of 486

thousand acre-feet (TAF) under the warm-wet scenario to a decrease of 203 TAF under the hot-dry scenario by the end of the century.

This 2025 UWMP includes additional climate change discussion in Chapters 3 and 4.

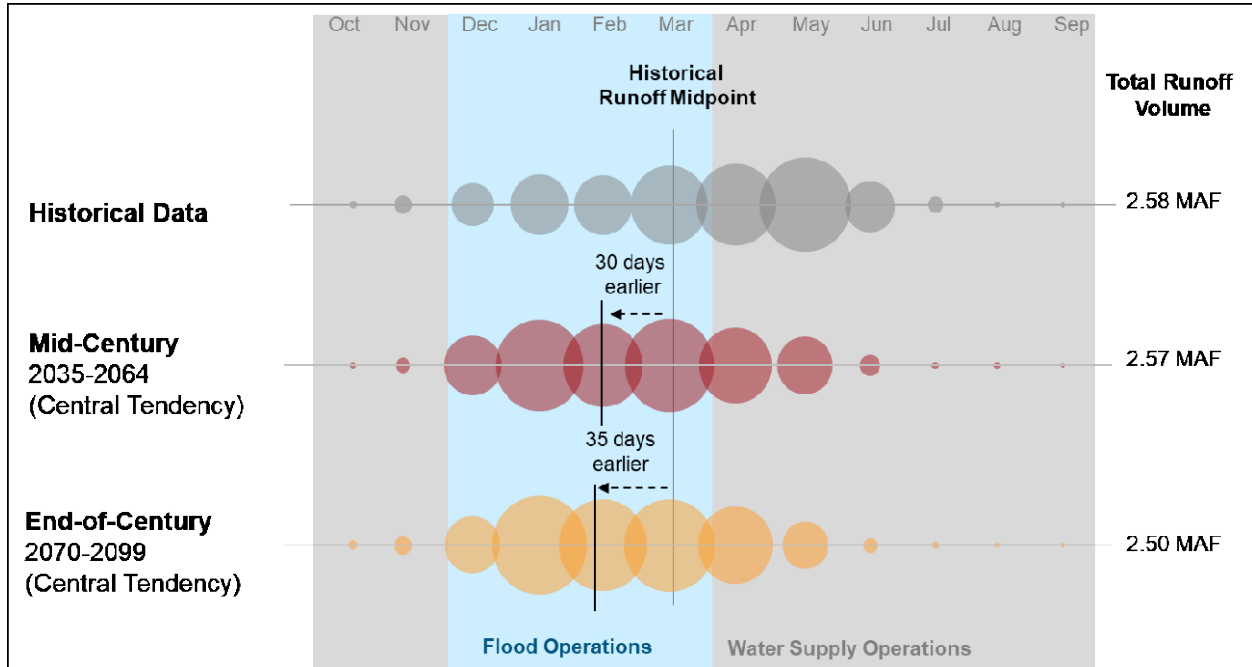


FIGURE 2-3. DISTRIBUTION OF AVERAGE MONTHLY RUNOFF FOR HISTORICAL RECORD (1922-2015) AND FUTURE PROJECTIONS UNDER CENTRAL TENDENCY CLIMATE SCENARIO

**Table 2-3** lists the change in annual climatic and hydrologic indicators between historical baseline observations (1915 to 2015) and projected future conditions for the ARBS area.

**TABLE 2-3. CHANGE IN HYDROLOGIC INDICATORS BETWEEN HISTORICAL OBSERVATIONS AND PROJECTED FUTURE HYDROLOGY**

Time Period	Climate Scenario	Precip. (in)	T <sub>avg</sub> (°F)	T <sub>max</sub> (°F)	T <sub>min</sub> (°F)	PET (in)	SWE avg. (in)	SWE max (in)	Runoff (TAF)
Historical Baseline									
1915-2015	Historical Observations	38.2	54.8	67.8	35.6	42.8	1.5	5.7	1,458
Variance from Historical Baseline									
2040-2069	Warm-Wet	1.9	4	6.2	1.6	1.6	-0.7	-2.3	701
	Central Tendency	0.1	5	8.1	2.1	2.7	-0.9	-2.8	-2
	Hot-Dry	-2.8	6.2	10.4	2.7	3.7	-1.1	-3.4	-206
2055-2084	Warm-Wet	3.8	4.7	7.4	2	2	-0.8	-2.5	199
	Central Tendency	-1.1	6.3	11.1	2.6	4.1	-1.08	-3.5	-93
	Hot-Dry	-3.4	7.9	13.3	3.7	5	-1.2	-3.8	-185
2070-2099	Warm-Wet	7	5.4	8.3	2.5	1.8	-0.9	-2.9	486
	Central Tendency	-0.6	6.5	11	2.8	3.9	-1	-3.3	-54
	Hot-Dry	-4.6	8.9	15.7	4.1	6.2	-1.3	-4.3	-203

### 2.3. CURRENT AND PROJECTED POPULATION, LAND USE, ECONOMY, AND DEMOGRAPHICS

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the District’s economic, social, and demographic trends give valuable insight to water management and planning. This section of the UWMP addresses these factors to provide a supportable basis for forecasting future water use in Chapter 4.

#### 2.3.1. CURRENT POPULATION AND HISTORIC TRENDS

The population served by the Elk Grove Water District includes a mix of users and user classes and follows similar demographic and population trends as the City. EGWD’s customer base is comprised of single-family residential (95.1 percent), commercial and institutional (2.8 percent), landscape irrigation (1.3 percent), multi-family residential (0.5 percent), with 0.3 percent of customer connections designated as industrial. The build out of the service area will consist of mainly residential, multi-family, and commercial land uses.

**Table 2-4** presents the recent and estimated current population for the District’s service area. Because the service area does not easily correlate to existing boundaries represented by the California Department of Finance in their historic and recent population analyses, the estimates in the table are derived using an occupancy rate and the residential connection data provided in **Table 2-1**.

The service area’s currently averages about 3.5 persons per connection.<sup>6</sup>

**TABLE 2-4. ESTIMATED POPULATION – HISTORICAL AND CURRENT**

2021	2022	2023	2024	2025
43,257	43,306	43,558	43,820	44,254

### 2.3.2. CURRENT AND PROJECTED LAND USE

As described previously, the District serves water into two areas: Service Area 1 and Service Area 2 (see **Figure 2-1**). Service Area 1 is nearly built out, with mostly infill projects remaining. Service Area 2 expects to receive the majority of additional growth.

Using information regarding planned developments within the District’s service area, an assessment was made to determine the likely number of new housing units that may be constructed within the District’s service area over the planning period. Further, this growth assessment was compared to the Sacramento Area Council of Governments (SACOG) 2025 Blueprint housing projections for the same area. Results of the assessment indicate that nearly 1,400 new residential connections are expected through 2050. This reflects an average annual growth rate of about 0.5%.

To estimate non-residential growth, the existing mix of residential to non-residential connections can be a proxy for estimating the future mix for the incremental new connections. As noted previously, residential connections represent about 96% of the District’s customers, with non-residential uses representing 4%. With the addition of almost 1,400 residential units between 2025 and 2050, the existing ratio would result in 61 new non-residential connections by 2050. Using the existing ratio of sub-classifications of non-residential customers, the 61 additional connections are assumed to be spread among commercial, industrial and landscape irrigation connections.

**Table 2-5** presents the expected new connections by customer classification over the UWMP’s planning horizon.

<sup>6</sup> Based on 2020 Census population and number of residential units.

**TABLE 2-5. CUMULATIVE NEW CONNECTIONS**

Customer Class	2030	2035	2040	2045	2050
Residential	426	1,196	1,225	1,283	1,371
Non-Residential	19	53	54	57	61

**Table 2-6** presents the expected total connections by classification, combining the new residential and non-residential connections with the existing connections. This connection forecast will be used to estimate future water use, as detailed in Chapter 4.

**TABLE 2-6. EXPECTED TOTAL CONNECTIONS**

Customer Class		2030	2035	2040	2045	2050
Existing	Single Family Residential	12,585	12,585	12,585	12,585	12,585
	Multi-Family Residential	59	59	59	59	59
	Commercial/Institutional	372	372	372	372	372
	Industrial	40	40	40	40	40
	Landscape Irrigation	173	173	173	173	173
New	Residential	426	1,196	1,225	1,283	1,371
	Non-Residential	19	53	54	57	61
Total	<b>Residential</b>	<b>13,070</b>	<b>13,840</b>	<b>13,869</b>	<b>13,927</b>	<b>14,015</b>
	<b>Non-Residential</b>	<b>604</b>	<b>638</b>	<b>639</b>	<b>642</b>	<b>646</b>

### 2.3.3. ECONOMIC TRENDS & OTHER SOCIAL AND DEMOGRAPHIC FACTORS

EGWD’s service areas are contained within the City of Elk Grove city limits. While the City’s boundaries include areas that are outside of EGWD’s service area, there is overall compatibility with respect to employment and growth characteristics.

Since the 1950’s, the region has experienced strong urban growth, typical of post-World War II suburban and metropolitan areas. During the 1990’s, the City of Elk Grove’s population grew by more than 70%, while job growth mainly occurred in other parts of the greater Sacramento region.<sup>7</sup> Major job sectors for the City’s population include government, healthcare,

<sup>7</sup> City of Elk Grove. General Plan. December 2023 (amended).

education, and tech industries, with overall job growth averaging 11.5% annually during the period 2000 to 2013. It is estimated that the City is expected to see an increase in jobs of approximately 32.0% in 2040 when compared to the 2016 number of jobs.<sup>8</sup>

In the years prior to the COVID pandemic, some areas within the greater Sacramento Region experienced a substantially low unemployment rate. **Figure 2-4** displays the Sacramento metropolitan area Labor Force and Employed populations as well as the resulting Unemployment Rate for the period 2010 through 2025. As seen on the figure, in September 2019, the region experienced the lowest unemployment rate for the period (3.1%). Commensurate with the impacts on the labor market due to the pandemic, 2020 saw the largest increase in the unemployment rate for the period, resulting in a high of 14% (April 2020).

The increased unemployment rate experienced during 2020 appears to be rebounding from the historic high. The rate of economic recovery for the region remains to be seen, indicating a high level of uncertainty with respect to pace and type of future economic job growth for the greater Sacramento region. Despite the recent increase in unemployment, the City's policy toward development entails increasing jobs and economic opportunities while acknowledging the importance of housing and a resident workforce.<sup>9</sup>

The DWR DAC Mapping Tool does not identify any portions within the District service area as a "Disadvantaged Community."<sup>10</sup> Per the United States Census Bureau, the City of Elk Grove has an estimated median income of \$122,229<sup>11</sup> while the threshold for Disadvantaged Community designation is less than \$98,800.

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<sup>8</sup> <https://www.sacog.org/home/showpublisheddocument/3297/638975101112800000>

<sup>9</sup> City of Elk Grove, Policy LU-1-2.

<sup>10</sup> <https://gis.water.ca.gov/app/dacs/>

<sup>11</sup> <https://www.census.gov/quickfacts/fact/table/elkgrovecitycalifornia/PST045224>

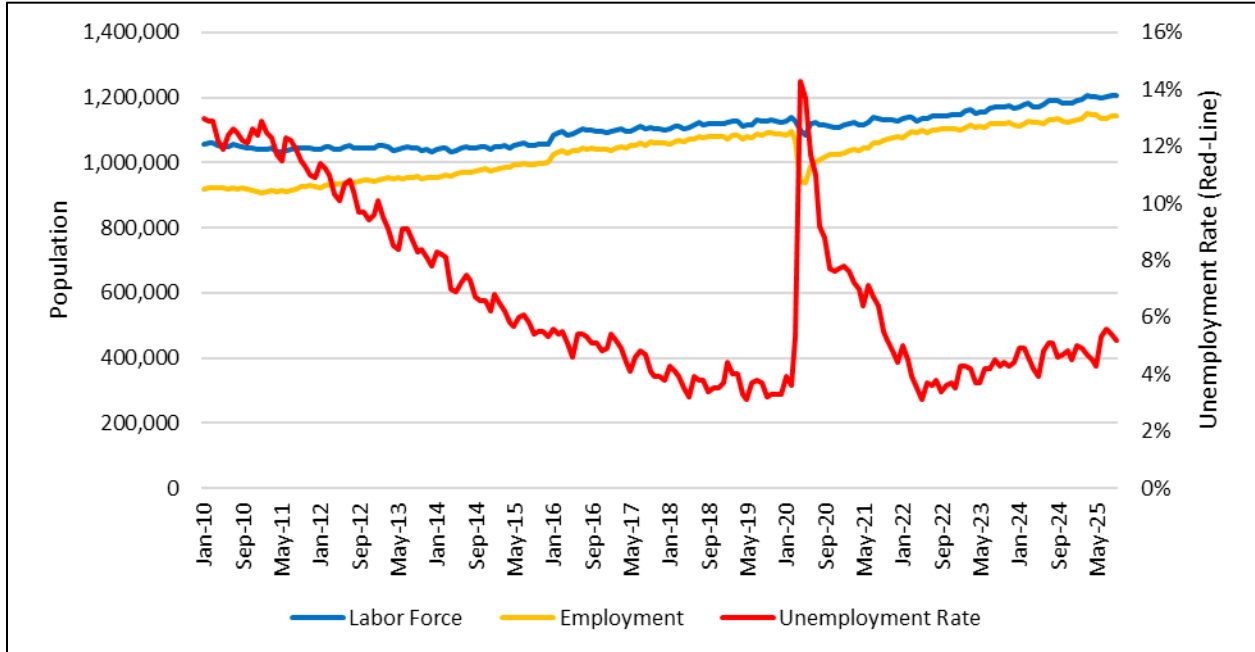


FIGURE 2-4. SACRAMENTO REGION LABOR STATISTICS<sup>12</sup>

### EXPECTED POPULATION BASED UPON LAND-USE PLANNING

To forecast projected service area population as accurately as possible requires consideration of the past growth rate, local economic predictions, and current and projected land uses. Importantly, one of the recent statutory updates to the UWMP Act states urban water suppliers “shall coordinate with local or regional land use authorities”<sup>13</sup> regarding land uses that may affect water management planning.

The District’s growth prospects are predominantly defined by the City’s Housing Element, with some minor continued growth, primarily for non-residential customers. Since boundaries used for various population projections made by the Department of Finance do not correlate to the District’s service area, the projected population for this UWMP is estimated by adding the existing population presented in **Table 2-4** to population based upon the total new residential connections shown in **Table 2-6** multiplied by the persons-per-connection occupancy rate. The resulting future population is provided in **Table 2-7**.

**TABLE 2-7. PROJECTED FUTURE POPULATION**

2030	2035	2040	2045	2050
47,842	48,277	48,379	48,582	48,891

<sup>12</sup> U.S. Bureau of Labor Statistics: Sacramento – Arden Arcade – Roseville, CA.

<sup>13</sup> CWC §10631(a).

## 2.4. DELIVERY SYSTEM DETAILS

The District serves customers through an array of groundwater wells, water treatment plants and distribution pipelines.

Further discussion of these systems and the water supply used within each is included in Chapter 3, with current and future customer water use described in detail in Chapter 4.

### 2.4.1. POTABLE SYSTEM

The District's primary function is delivering potable water to its customers within each previously described service area (see **Figure 2-1**).

Service Area 1 is supplied by several groundwater wells that deliver water to a potable groundwater treatment plant owned and operated by the District. The system includes the treatment plant, two storage tanks, production wells serving the plant, and various distribution system pipes and appurtenances. The water treatment plant, referred to as the Railroad Street Treatment and Storage Facility, has a maximum day capacity of 10.4 million gallons per day (MGD). The facility can pump up to 16,000 gallons per minute. Groundwater is delivered to the plant from the EGWD's deep production wells, where it is treated before being delivered to customers.

Service Area 2 is supplied with treated water from SCWA-owned and operated groundwater production wells and some surface water from SCWA's Vineyard Water Treatment Plant. The water from SCWA interties into the District's Service Area 2 distribution system at multiple locations. This supply is fluoridated. In accordance with Title 22, §64433.2 of the State Board regulations, the optimal fluoride level is 0.7 mg/L and the fluoride control range from 0.6 mg/L – 1.2 mg/L.<sup>14</sup>

The District is responsible for the maintenance and operation of the transmission and distribution mains for Service Area 1 and the distribution mains for Service Area 2. SCWA operates two water treatment plants (WTP) in Service Area 2, the East Elk Grove WTP and the East Park WTP. The primary potable water system facilities owned and operated by EGWD are shown in **Figure 2-5**.

The District does not currently have any recycled water systems, nor does it receive recycled water from its SCWA contract.

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<sup>14</sup> [https://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/Fluoridation.html](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.html)

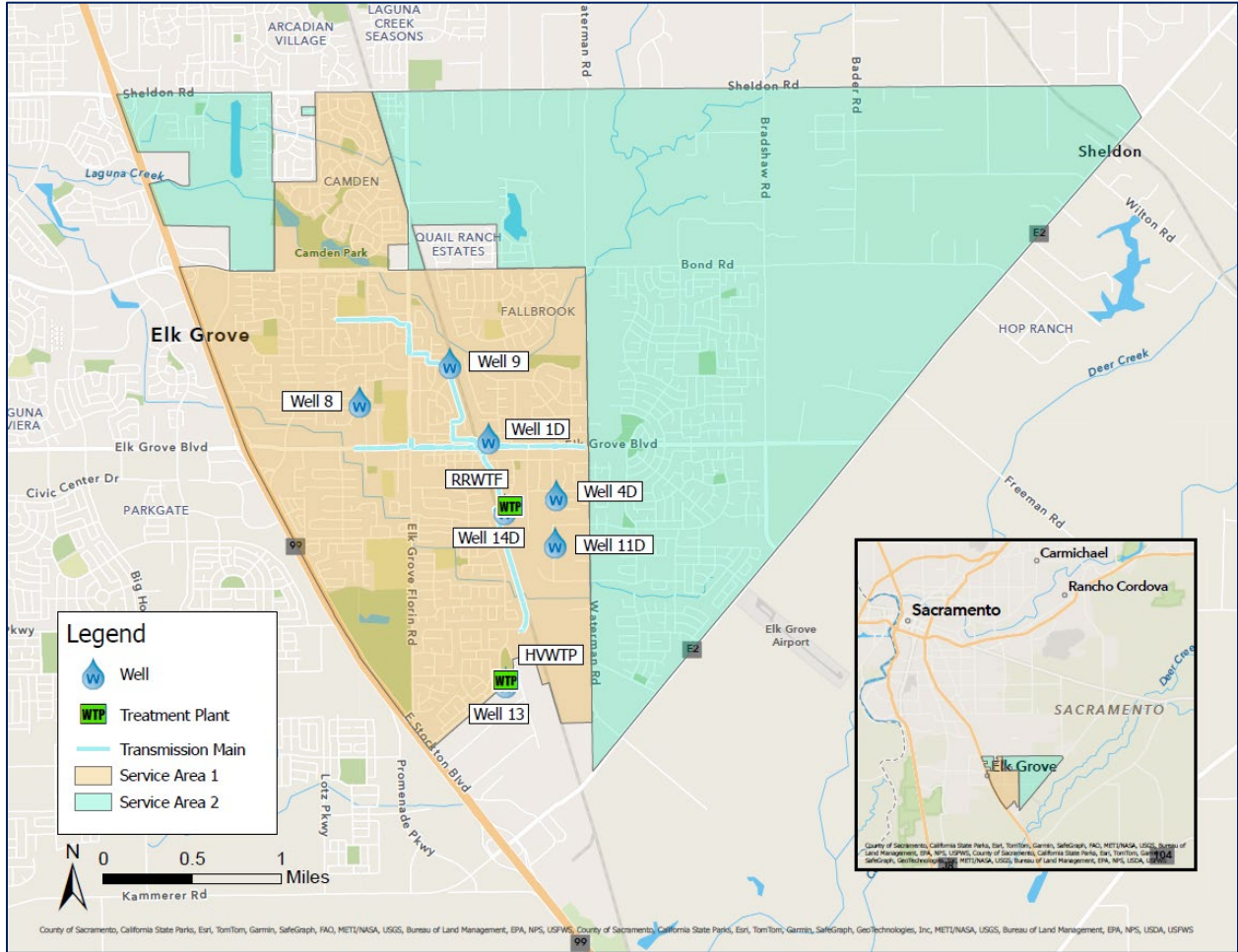


FIGURE 2-5. POTABLE WATER SYSTEM

## 2.5. ENERGY INTENSITY

The energy required to supply water to EGWD’s customer base is reported in **Table 2-8** below, per UWMP requirements. Referred to as “Energy Intensity Reporting” for urban water suppliers, energy Intensity is defined as: total amount of energy expended in kilowatt-hours (kWh) by the urban water supplier on a per acre-foot basis to take water from the location where the urban water supplier acquires the water to its point of delivery.

For purposes of UWMP reporting, the District uses the Total Utility Approach described in DWR’s UWMP Guidebook. This method sums the annual net energy consumed for all water management processes, divided by total volume of water in acre feet. These processes include diversion, conveyance, placement into storage, treatment, and distribution.

**TABLE 2-8. ENERGY INTENSITY – TOTAL UTILITY APPROACH**

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	6,663
Energy Consumed (kWh)	2,526,926
Energy Intensity (kWh/acre-foot)	379

# CHAPTER 3

## WATER SUPPLY CHARACTERIZATION

EGWD utilizes both groundwater and wholesale water delivered from Sacramento County Water Agency (SCWA). The District has limited options for water supplies given its geographic boundaries and proximity to local surface water bodies. Although SCWA surrounds the District and provides water to the District, EGWD still has independent access to the groundwater basin and captures those supplies for use in its service area. Through its groundwater pumping and a wholesale water contract with SCWA, the District supplies water to meet its customers’ water needs.

### 3.1. WATER SUPPLY SOURCES

As discussed in Chapter 2, the District provides water supplies to two service areas – Service Area 1 and Service Area 2 (see **Figure 2-1**).

Historically, the District’s water supply has consisted of self-supplied groundwater and water purchased from SCWA. The District relies solely on its own groundwater resources as the source of supply for Service Area 1, while Service Area 2 uses water purchased from and supplied by SCWA. The supplies provided by SCWA may be derived from a number of water sources in SCWA’s water supply portfolio.

Groundwater is supplied to Service Area 1 by a series of three shallow wells and four deep wells, all of which are located within the District’s service area. The groundwater production from these wells has been relatively stable and reflects the demands within Service Area 1.

**Table 3-1** shows the supply produced from Service Area 1 wells for 2021 through 2025.

**TABLE 3-1. SERVICE AREA 1 WELLS - PRODUCTION 2021-2025**

Year	Groundwater (acre-feet)
2021	4,317
2022	4,200
2023	4,015
2024	4,247
2025	4,213

Service Area 2, which is located within SCWA’s Zone 40, has access to both SCWA’s groundwater and surface water resources.

Service Area 2 is supplied with water from SCWA through a wholesale Master Water Agreement (Agreement) with SCWA. The original agreement was signed in 1995. In 2002, the parties “restated” the Agreement in order to clarify the parties, terms, and conditions. The Agreement provides that SCWA will provide a permanent supply of wholesale treated water to the District for use within the District’s service area.<sup>15</sup> The contract has a 50 year term with an automatic renewal clause for another 50 years unless one party provides a 5 year notice of intent not to extend.<sup>16</sup> The Agreement was developed to establish a framework for providing a permanent supply of wholesale treated groundwater and/or surface water within the District’s service area, while supporting conjunctive use and groundwater basin management objectives. The delivery language in the Agreement states: “SCWA shall deliver all potable water necessary for FRCD’s retail customers in the Expanded Franchise Area, including water for fire protection consistent with SCWA design and operations standards in effect at the time a facility is constructed.”<sup>17</sup>

**Table 3-2** below provides supplies delivered to Service Area 2 from SCWA under this Agreement for 2021-2025.

**TABLE 3-2. SERVICE AREA 2 WATER SUPPLY DELIVERIES FROM SCWA 2021-2025**

Year	SCWA Water (acre-feet)
2021	2,544
2022	2,492
2023	2,336
2024	2,495
2025	2,449

### 3.2. GROUNDWATER SUPPLIES

Groundwater supplies are a major component of the District’s water supply portfolio. Groundwater supplies are derived from the District’s own production facilities and SCWA’s well systems that import water into the District’s service area. This section provides a description of the groundwater basin, characterizes the management structures related to

<sup>15</sup> First Amended and Restated Master Water Agreement Between Sacramento County Water Agency and Florin Resource Conservation District/Elk Grove Water Service, Successors-In-Interest to Elk Grove Water Works, June 28, 2002 at Article I and Article III (Hereafter “Agreement”). Elk Grove Water District is part of FRCD.

<sup>16</sup> Agreement at Article VI.

<sup>17</sup> Agreement at Article III.a.

various areas in the groundwater basin, and quantifies supplies available to the District from the groundwater basin.

### 3.2.1. Groundwater Basin Description

EGWD derives its groundwater supplies from the South American Subbasin of the Sacramento Valley Groundwater Basin. The South American Subbasin (DWR Basin No. 5-21.65) covers approximately 388 square miles and is defined as the area bounded on the west by the Sacramento River, on the north by the American River, on the south by the Consumnes and Mokelumne rivers, and on the east by the Sierra Nevada mountain range. More specifically, the eastern basin boundary is defined by the Sierra Nevada foothills and follows a north-south line extending from Folsom Reservoir to Rancho Murieta. Along this line, little groundwater flows into or out of the groundwater basin. The rivers that surround the South American Subbasin generally create a groundwater divide in the shallow subsurface although there is interaction between groundwater basins at greater depths. The western portion of the subbasin consists of nearly flat flood plain deposits from the surrounding river and tributaries.

Bulletin 118-3 identifies and describes various geologic formations that constitute the water-bearing deposits underlying the District's service area. These formations include an upper, unconfined aquifer system consisting of the Victor, Fair Oaks, and Laguna Formations (now known as the Modesto Formation), and a lower, semiconfined aquifer system consisting primarily of the Mehrten Formation. These formations are typically composed of lenses of interbedded sand, silt, and clay, interlaced with coarse-grained stream channel deposits. The Mehrten formation outcrops near the Sierra Foothills along the eastern Central Basin boundary and is typically characterized as a black sandy lens.

Groundwater in the South American Subbasin generally occurs in a shallow aquifer zone (Laguna or Modesto Formation) or in an underlying deeper aquifer zone (Mehrten Formation). Within the subbasin, the shallow aquifer extends approximately 200 to 300 feet below the ground surface and, in general, water quality in this zone is considered to be good, with the exception of arsenic detections in a few locations. The shallow aquifer is typically used for private domestic wells requiring no treatment unless high arsenic values are encountered, causing owners to possibly target other water-bearing strata.

The deep aquifer is separated from the shallow aquifer by a discontinuous clay layer that serves as a semi-confining layer for the deep aquifer. The base of the potable water portion of the deep aquifer averages approximately 1,400 feet below ground surface (bgs). Water in the deep aquifer typically has higher concentrations of total dissolved solids (TDS), iron, and manganese. Groundwater used in the South American Subbasin is supplied from both the shallow and deeper aquifer systems.

**Figure 3-1** below shows EGWD's location in relation to the South American Subbasin.

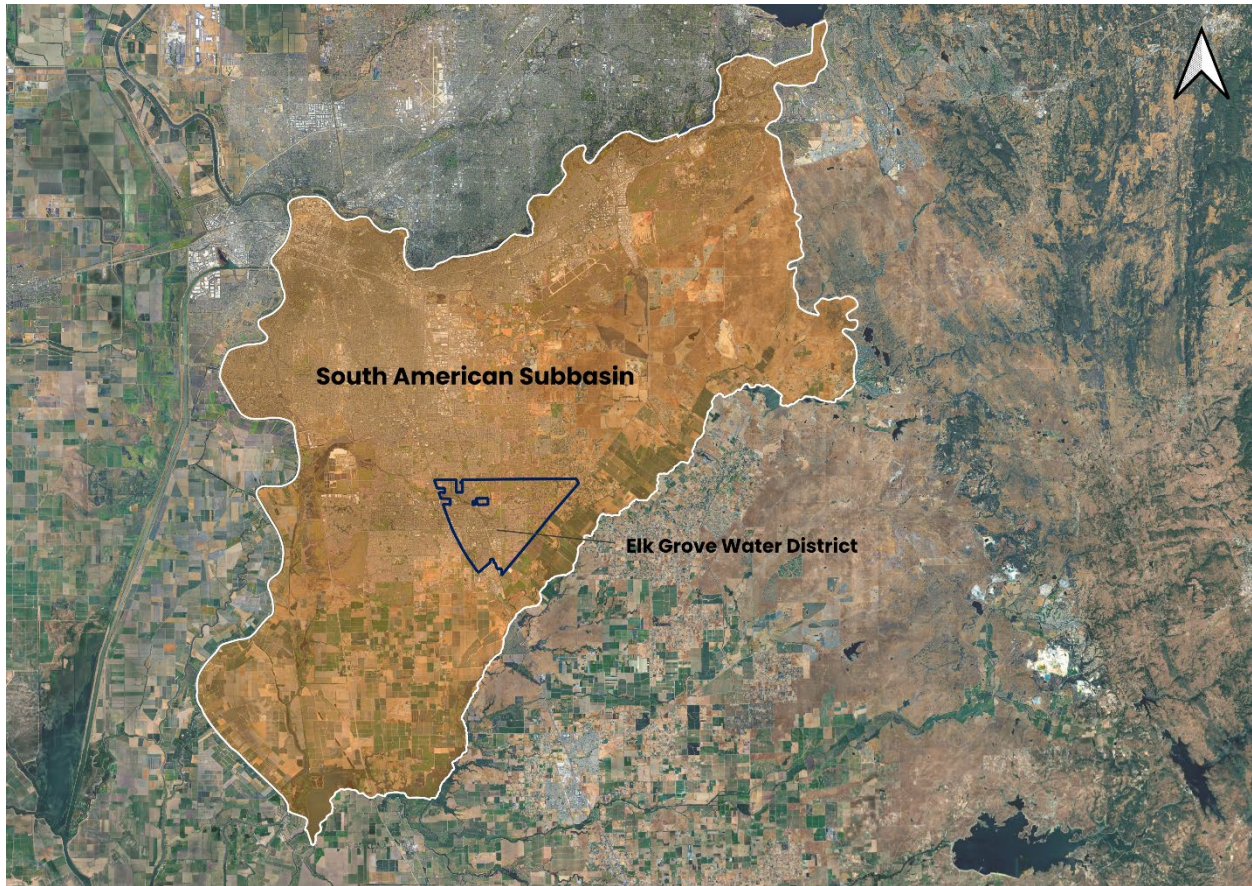


FIGURE 3-1. EGWD'S LOCATION IN THE SOUTH AMERICAN SUBBASIN

The groundwater wells within the District's system extract water from aquifers between 200 and 1,000 feet below the ground elevation. Groundwater elevations are regularly monitored within the region by DWR and the Sacramento Central Groundwater Authority (SCGA). Some of these records date back to the early 1950s. Hydrographs in the vicinity of the District's service areas indicate that the groundwater elevations have declined from the early 1950s through the late 1970s. From approximately 1980, the groundwater elevations have remained relatively consistent, except for a temporary decline in the early to mid-1990s. With the commissioning of SCWA's Vineyard WTP in 2011, groundwater elevations in the South American Subbasin have been on a trend of recovery, even though recovery was partially offset by the 2012-2016 drought. The static depth to groundwater within the District currently ranges between 60 to 110 feet below the ground surface.

Water produced from the Laguna Formation and the Mehrten Formation is considered generally good quality with low total dissolved solids. Water produced from the Laguna Formation often meets all water quality standards but exceeds the Maximum Contaminant Level (MCL) for arsenic within some areas of the Subbasin. The Mehrten Formation often contains manganese and iron, which exceed the MCLs. The upper portion of the Mehrten Formation, (between 300 feet to 700 feet within the District), occasionally exceeds the MCL for

arsenic. The lower portion of the Mehrten Formation, (between 700 feet to 1,300 within the District) generally has concentrations of arsenic that are under the MCL but still require treatment to remove manganese and iron.

The quality of the groundwater supplied by the District meets the drinking water standards. The District provides centralized water treatment to remove manganese and iron from water produced by the District's four deep wells. Two of the three active shallow wells require no treatment other than disinfection to meet drinking water standards while the third requires treatment for arsenic removal.

The Sustainable Groundwater Management Act (SGMA) was signed into law in September 2014. In 2021, the six Groundwater Sustainability Agencies (GSAs) that cover the South American Subbasin submitted a Groundwater Sustainability Plan (GSP). EGWD lies within the jurisdiction of the Sacramento Central Groundwater Authority GSA.

### 3.2.2. EGWD GROUNDWATER SUPPLIES

EGWD's Service Area 1 is an independent system that currently is served entirely by groundwater deliveries from the District's wells. There are seven active wells in the Service Area 1 system with an operational capacity of approximately 12 MGD. This translates to an approximate total pumping capacity of 8,000 acre-feet with the consideration of a typical diurnal demand pattern.

The groundwater system makes the supplies available in Service Area 1 100% reliable in all year types. As shown in **Table 3-3**, EGWD anticipates the following groundwater production to be available in normal, single dry, and five consecutive dry years through 2030. **Table 3-4** shows the normal, single dry, and five consecutive dry years of production through 2050. Although the supplies shown in these two tables are the available supply based on the groundwater basin's sustainable yield and EGWD's system capacity, EGWD would only produce as much water as it needs to meet demands in Service Area 1.

**TABLE 3-3. SERVICE AREA 1 GROUNDWATER SUPPLY ESTIMATED AVAILABILITY & RELIABILITY, 2026 - 2030**

Year Type		Supply Available (acre-feet)
Normal		8,000
Single Dry-Year		8,000
Multi-Year Drought	2026	8,000
	2027	8,000
	2028	8,000
	2029	8,000
	2030	8,000

**TABLE 3-4. SERVICE AREA 1 GROUNDWATER ESTIMATED FUTURE AVAILABILITY IN FIVE CONSECUTIVE DRY YEARS**

Year Type		2030	2035	2040	2045	2050
		(acre-feet)				
Normal		8,000	8,000	8,000	8,000	8,000
Single Dry-Year		8,000	8,000	8,000	8,000	8,000
Multi-Year Drought	Year 1	8,000	8,000	8,000	8,000	8,000
	Year 2	8,000	8,000	8,000	8,000	8,000
	Year 3	8,000	8,000	8,000	8,000	8,000
	Year 4	8,000	8,000	8,000	8,000	8,000
	Year 5	8,000	8,000	8,000	8,000	8,000

### 3.3. EGWD CONTRACT SUPPLIES WITH SCWA

As previously described in this chapter, EGWD holds a Water Service Agreement with SCWA. This Agreement states that SCWA will deliver water to meet EGWD’s water supply needs through 2050. SCWA has surface water, groundwater, and recycled water assets, however, Service Area 2 is not currently supplied with recycled water.

SCWA is developing substantial surface water supplies as part of the Freeport Regional Water Authority (FRWA), which may become more available to Service Area 2 in the future. In addition, SCWA could deliver water derived from its Water Rights Permit, CVP Contracts, other water rights, and Aerojet remediated groundwater supplies derived from foreign sources of groundwater in the American River Watershed through the FRWA system that could reach

EGWD. Further discussion of parameters that would allow greater volumes of surface water supplies to reach EGWD is beyond the scope of this document.

Development within Service Area 2 is required to pay the Zone 40 Development Fee for new building permits, and a monthly user fee for Zone 40 capital projects. The District does not have a water right other than its contract right to the water delivered through SCWA’s system. The SCWA conjunctive use water supply is considered a permanent and reliable source based upon the language of the Agreement.

The Agreement makes SCWA supplies to the District 100% reliable for Service Area 2 in all year types. As such, EGWD anticipates the following water deliveries from SCWA in normal, single dry, and five consecutive dry years through 2030 in **Table 3-5** and production through 2050 in **Table 3-6**. These supplies are generally rounded in order to show that EGWD could call on more water from SCWA than it has historically used to meet its service area demands under the terms of the Agreement.

**TABLE 3-5. SERVICE AREA 2 SCWA AGREEMENT SUPPLY ESTIMATED AVAILABILITY & RELIABILITY, 2026 - 2030**

Year Type		Supply Available (acre-feet)
Normal		5,000
Single Dry-Year		5,000
Multi-Year Drought	2026	5,000
	2027	5,000
	2028	5,000
	2029	5,000
	2030	5,000

**TABLE 3-6. SERVICE AREA 2 SCWA AGREEMENT ESTIMATED FUTURE AVAILABILITY IN FIVE CONSECUTIVE DRY YEARS**

Year Type		2030	2035	2040	2045	2050
		(acre-feet)				
Normal		5,000	5,000	5,000	5,000	5,000
Single Dry-Year		5,000	5,000	5,000	5,000	5,000
Multi-Year Drought	Year 1	5,000	5,000	5,000	5,000	5,000
	Year 2	5,000	5,000	5,000	5,000	5,000
	Year 3	5,000	5,000	5,000	5,000	5,000
	Year 4	5,000	5,000	5,000	5,000	5,000
	Year 5	5,000	5,000	5,000	5,000	5,000

### 3.4. OTHER WATER SUPPLY SOURCES

#### 3.4.1. RECYCLED WATER

The District does not currently utilize any recycled water and does not have any confirmed plans to implement a recycled water system in the future. SCWA currently obtains and serves recycled water within its Zone 40 service area and could feasibly expand into the District’s service area, however, no clear plans for this to occur exist. The District does not plan to develop its own recycled water supply.

The recycled water SCWA does serve is produced from a partnership with Sacramento Area Sewer District (SASD) and the Sacramento County Environmental Management Department. The water recycling facility is located within the City of Elk Grove and completed a \$1.7 billion upgrade in 2023. SASD performed a Water Recycling Opportunities Study (WROS) that identified five key target areas for potential recycled water uses. The District exists within the Target Area identified as Target Area I South Area. However, this area was found to have a decreased potential for future recycled water use due to its limited overall use potential, and infrastructure costs. Accordingly, based on the WROS, it is not anticipated that the District will use any recycled water for its service area presently and out into the future.

#### 3.4.2. DESALINATED WATER

Desalination of ocean water is not physically or financially viable for the District at this time and it has no future plans to develop water supplies derived from desalination activities.

#### 3.4.3. TRANSFER AND EXCHANGE OPPORTUNITIES

The District has opportunities for limited potable water transfers or exchanges. All of these transfers or exchanges would likely involve SCWA because SCWA controls the wheeling

facilities that could deliver surface water assets to the District. Furthermore, the District could move water between Service Area 1 and Service Area 2 through numerous valves that the District has not activated. Therefore, with some creative thinking and willing partnerships, the District could engage in forms of water transfers that may have long-term regional benefit. Some examples of these are described below.

### **IN LIEU BANKING ARRANGEMENT WITH SURFACE WATER PURVEYOR**

The District could engage a water purveyor with surface water assets connected to the Sacramento River watershed and use those surface water assets in lieu of using its groundwater. In this scenario, the District would receive the right to divert water through a temporary water transfer agreement and appropriate regulatory steps. The water would be diverted at the Freeport Regional Water Agency diversion facility and delivered directly to the District through SCWA's wheeling and treatment facilities. The benefit of this sort of transaction is that it would relieve pressure on the groundwater basin and preserve the groundwater supplies for dry periods when surface water assets are less available.

A second form of an in-lieu banking alternative might include assigning the rights to the banked groundwater to another agency. For instance, if Golden State Water Company could deliver some of its surface water assets directly to the District in normal and wet years, the District could assign a portion of its banked groundwater assets to Golden State Water Company for use in dry years. An in-lieu banking and exchange agreement can work where an entity shares resources in the subbasin.

### **THIRD PARTY WATER EXCHANGE ARRANGEMENT**

In other instances, water exchanges may benefit multiple parties through creative transfer arrangements. For example, if the District were to purchase water and deliver it directly to SCWA for SCWA's broader distribution in its service area, then SCWA is preserving groundwater assets that it might otherwise use for dry year availability that could be used in EGWD's service area. In this situation, SCWA may also reduce its treatment costs, etc. by increasing the utility of the FRWA (which has cost variables) as well as the per acre-foot cost of treatment at its Vineyard Water Treatment Plant. In other words, acquiring an asset and creating an exchange arrangement with SCWA may have multiple benefits not only to manage water use in dry years but also in long-term groundwater basin recovery and management of costs related to FRWA and Vineyard system operations.

## **3.5. PLANNED WATER SOURCES**

At this time, EGWD is not planning to develop any additional water supply sources in its service area.

### 3.6. WATER SUPPLY PORTFOLIO ASSESSMENT

The District’s water supplies are stable and reliable. Both the groundwater supply and SCWA’s surface water supply are well-preserved. As such, water service to Service Area 1 and Service Area 2 should remain stable in all year types.

The South American Subbasin GSP (SASb GSP) found that the South American subbasin will be sustainable over the 20-year time frame required by SGMA as long as planned sustainability projects are implemented. These projects include both recycled water and recharge projects and are expected to raise current groundwater levels, maintain storage levels and protect groundwater supplies. Over the last few decades, the water levels in the Subbasin have remained stable.

The District’s groundwater supplies and contracted supplies with SCWA account for approximately 13,000 acre-feet per year from the South American Subbasin’s long-term average sustainable yield of 235,000 AFY. This quantity of available groundwater is more than sufficient to meet the District’s current water needs and accommodate the anticipated future water demands discussed in Chapter 4.

**Table 3-7** shows the combined Service Area 1 and Service Area 2 supplies in normal, single dry, and five consecutive years through 2030. **Table 3-8** shows the combined Service Area 1 and Service Area 2 supplies through 2050.

**TABLE 3-7. EGWD TOTAL POTENTIAL SUPPLIES THROUGH 2030**

Year Type		Supply Available (acre-feet)
Normal		13,000
Single Dry-Year		13,000
Multi-Year Drought	2026	13,000
	2027	13,000
	2028	13,000
	2029	13,000
	2030	13,000

**TABLE 3-8. EGWD TOTAL POTENTIAL SUPPLIES THROUGH 2050 (ACRE-FEET)**

Total Supply		2030	2035	2040	2045	2050
		(acre-feet)				
Normal		13,000	13,000	13,000	13,000	13,000
Single Dry Year		13,000	13,000	13,000	13,000	13,000
Multi-Year Drought	Year 1	13,000	13,000	13,000	13,000	13,000
	Year 2	13,000	13,000	13,000	13,000	13,000
	Year 3	13,000	13,000	13,000	13,000	13,000
	Year 4	13,000	13,000	13,000	13,000	13,000
	Year 5	13,000	13,000	13,000	13,000	13,000

# CHAPTER 4

## WATER USE

Developing a thorough understanding of water use enables the District to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This chapter characterizes EGWD’s current and forecasted retail customer water needs, examining how various factors such as seasons, land use classifications, and differing hydrologic conditions impact water use.

A thorough analysis of the District’s past and current water use enables realistic water use predictions to be made for the future that consider anticipated growth, new regulations, changing climate conditions, and trends in customer water use behaviors. After individually analyzing each water use sector, information can be aggregated into a comprehensive projection of customer water use that becomes the foundation for integration with the District’s water supplies (see Chapter 3) to assess long-term water system reliability (see Chapter 5).

This Chapter is organized as follows:

- **Current Customer Water Use** – This subsection presents data reflecting EGWD’s residential and non-residential customers for 2021 through 2024 as well as the actual 2025 water use and presents the distribution system losses for this same period.
- **Demand Management Measures** – This subsection provides a narrative description of each water demand management measure implemented over the past five years and describes EGWD’s planned measures for the foreseeable future.
- **Forecasting Customer Use** – This subsection presents the derivation and results of future water use forecasts within the District’s service area, including land-use classifications, unit demand factors, and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- **Projecting Disadvantaged Community Water Use** – This subsection presents the estimated water use necessary to meet lower income households, pursuant to CWC §10631.1.

## 4.1. CURRENT CUSTOMER WATER USE

As described in Chapter 2, EGWD serves potable water to approximately 13,200 customer connections. Under normal circumstances, all of the water supplied to its customers is drawn from the District’s groundwater wells, treated at one of the water treatment plants, or derived through connections to the Sacramento County Water Agency (see Chapter 3), and delivered to the District’s customers. Information about the District’s current customers, their recent and expected water use trends, and the District’s on-going demand management efforts targeting these customers provide a foundational basis for this UWMP’s water use forecast to 2050.

This subsection presents relevant water use information regarding current and projected water use.

### 4.1.1. CUSTOMER WATER USE: 2021 TO 2024

Recent customer water use data can help the District understand water use trends, effects of temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. Additionally, the District is required to quantify past customer water use pursuant to the CWC §10631(d)(1).

**Table 4-1** presents the District’s past potable water use by customer classification for 2021 through 2024 in acre-feet. While the District tracks connections using multiple categories (see **Table 2-1**), it reports water use by only two categories:

- Residential
- Commercial, Industrial and Institutional (CII)

**TABLE 4-1. CUSTOMER USE 2021 TO 2024 (VALUES IN ACRE-FEET)**

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Residential	2021	250	236	245	339	517	598	655	643	581	531	326	242	<b>5,164</b>
	2022	224	248	315	350	382	533	580	579	565	468	404	274	<b>4,923</b>
	2023	228	224	231	228	364	502	576	591	550	487	406	297	<b>4,684</b>
	2024	242	219	214	257	343	539	640	639	589	531	443	275	<b>4,930</b>
Commercial, Industrial, Institutional	2021	43	41	39	61	142	180	198	220	184	163	91	47	<b>1,407</b>
	2022	40	47	66	92	95	160	183	171	170	170	115	59	<b>1,367</b>
	2023	45	39	40	42	96	158	195	205	188	144	107	66	<b>1,325</b>
	2024	55	47	54	54	94	160	187	219	229	166	133	63	<b>1,462</b>
Total Metered Deliveries	2021	294	277	283	400	659	778	853	863	765	694	417	289	<b>6,571</b>
	2022	264	296	381	442	477	693	763	750	735	638	519	333	<b>6,290</b>
	2023	273	263	271	270	461	661	770	796	738	631	513	363	<b>6,009</b>
	2024	297	266	268	311	437	699	827	858	819	697	576	338	<b>6,393</b>

The historic data also provides insight into the relative ratio of differing customer classification to each other as well as seasonal variations. For instance, total use was relatively consistent for 2021 through 2024. Yet, the CII sector has significantly lower use in winter and spring months compared to summer months. The residential classification illustrates two important characteristics: (1) it represents nearly 80% of the annual water use, and (2) it has summer demands that almost three times the monthly volume needed in winter months.

### 4.1.2. Customer Use in 2025

Customers served by the District are metered at their connection to the District’s potable water distribution system. As of January 1, 2024, for each customer account, the District is required to collect and submit metered delivery values to the State Water Resources Control Board (SWRCB) on a monthly basis, summarized annually in an auto-generated Clearinghouse Annual Inventory Report (CAIR Report). This data was formerly submitted as part of EGWD’s annual reporting to the SWRCB Division of Drinking Water and to DWR. The 2025 actual customer use presented in **Table 4-2** represents the summarized delivery to all the District’s customers. It does not, however, include the distribution system losses inherent in a pressurized water delivery system that occur during the District’s efforts to treat, store and route the water throughout the extensive distribution system to each customer’s connection.

**TABLE 4-2. TOTAL DISTRICT CUSTOMER WATER USE: 2025 ACTUAL USE (VALUES IN ACRE-FEET)**

Use Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Residential	234	240	228	261	413	550	626	617	608	494	334	241	4,846
Commercial, Industrial, Institutional	44	48	42	46	100	187	228	227	202	182	86	59	1,450
<b>Total</b>	<b>279</b>	<b>288</b>	<b>270</b>	<b>306</b>	<b>512</b>	<b>736</b>	<b>854</b>	<b>844</b>	<b>809</b>	<b>676</b>	<b>420</b>	<b>300</b>	<b>6,296</b>

### 4.1.3. EXISTING DISTRIBUTION SYSTEM LOSSES

Distribution system water losses (also known as “real losses”) are the physical water losses from the water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter). Additionally, “apparent losses” include all types of inaccuracies associated with customer metering, systematic data handling errors, and/or unauthorized water consumption.

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association (AWWA) Method.<sup>18</sup> An electronic copy of the audit in Excel format is to be submitted to the DWR by January 1 of each year for the prior year’s estimated system losses, using DWR’s online submittal tool pursuant to Code of Regulations §638.5. The District’s submittals for the last 5 years are shown in **Table 4-3**. The 2025 estimate has not been officially submitted to DWR as of the drafting of this UWMP but is estimated to be approximately 178 acre-feet over the year, or about 4.3% of the water entering the District’s distribution system.

**TABLE 4-3. DISTRIBUTION SYSTEM LOSS: 2021 THROUGH 2025**

	2021	2022	2023	2024	2025
Real Water Loss (acre-feet)	226	275	185	161	178
% of Total Supply	5.2%	6.5%	4.7%	3.8%	4.3%

Note: Water loss audits cover SA 1.

As can be anticipated given the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. On average, however, the District’s distribution system loss, for the period 2021 through 2025, represents about 5% of the water entering the distribution system.

<sup>18</sup> Title 23 California Code of Regulations §638.1 et seq.

#### 4.1.4. WATER LOSS CONTROL STANDARD

The CWC §10608.34 required the State Water Resources Control Board (SWRCB) to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the District was developed utilizing information submitted as part EGWD’s annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 15.8 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied is 3.5%. Using the information from the same period, the average “apparent” water loss averaged 1.4% (of total water supplied). The total water loss estimate as a percentage of total water supplied, for purposes of projecting future requirements is 5.0% (rounded). This average percentage is used for purposes of forecasting water use through 2050.

The District’s recent water loss audit reported a total of 161.34 AF of real losses and 99.27 AF of apparent losses, with 7,999 total service connections. These values produce a real water loss of 18 gallons per service connection per day and an apparent loss of 11.1 gallons per service connection per day.

## 4.2. COMPLIANCE WITH WATER USE TARGET (SBX7-7)

This section examines EGWD’s derivation and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SBX7-7, introduced water conservation targets that served as a valuable measure of progress through 2020. Urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020, and show the 20% reduction was achieved in this 2025 UWMP.

The District’s 2020 gallons per capita per day (GPCD) target was established in the 2015 UWMP as 191 GPCD, derived as the “gross water use” divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under CWC §10608.20(b). The District’s calculation of their 2020 actual GPCD used the same methodology.

“Gross water” was defined as the total “Potable Water” leaving the District’s water treatment plant, representing both the customer deliveries and the distribution system losses. This value, divided by the District’s estimated population in 2020, resulted in a compliance value of 137 GPCD. Because this value was less than the District’s established target, the District was determined to be in compliance with CWC §10608.24(b).

## 4.3. DEMAND MANAGEMENT MEASURES

Pursuant to CWC §10631(e), the District needs to provide a narrative discussion of the water demand management measures it has implemented, is currently implementing, and plans to implement. The historic and on-going measures can help the District understand the

effectiveness on managing existing customer uses so as to help guide refinements, emphasis or augmentation that will help EGWD to best meet its water use objective.

EGWD is also a member of the California Water Efficiency Partnership (CalWEP) the successor organization to California Urban Water Conservation Council (CUWCC). The District’s demand management measures are highlighted in this subsection.

### 4.3.1. FOUNDATIONAL DEMAND MANAGEMENT MEASURES

This subsection describes the foundational demand management measures (DMMs) that underpin the District’s operations and customer deliveries. These particular DMMs represent adopted ordinances, policies, and long-standing budgeted conservation programs.

#### WATER WASTE PREVENTION ORDINANCES

Water waste is prohibited in the District’s current Water Shortage Contingency Plan (WSCP), adopted on June 16, 2026. Under the WSCP, customers are encouraged to use water efficiently through all stage declarations. The WSCP prohibits all users from unreasonable waste and includes graduated penalties for waste and/or unreasonable use during all stage declarations. For all conditions, including Normal Water Supply, restrictions on water waste include:

- Runoff prohibited.
- Watering after rainfall event prohibited.
- Automatic shutoff nozzles are required for all hoses.
- Washing driveways and other paved areas is prohibited.
- Pools, ponds, and fountains are required to use recirculated water.

In addition, the District’s website also allows for reporting of waste with the “Report Water Waste” link,<sup>19</sup> allowing for proactive response and improved management. The District has implemented this DMM over the planning period (through multiple versions of the WSCP) and will continue to actively manage water waste through 2050.

#### METERING

All of the District’s customers are metered and billed monthly. Metered water service rates are comprised of two parts: a fixed charge and a commodity charge. The fixed charge is dependent on the meter size, while the commodity charge is based on volume of usage. In addition to the fixed charge, residential customers are also subject to a tiered rate structure, based on metered usage. The District began installing advanced metering infrastructure

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<sup>19</sup> <https://www.egwd.org/report-water-waste/>

(AMI) in 2026, with full system coverage planned by 2029. AMI will provide more timely information to customers and for the District's management needs.

### CONSERVATION PRICING

The District's water rate structure is set to generate the necessary funds to efficiently operate the District's water system and maintain reliable water supplies. In addition to a fixed charge based on meter size, the District utilizes a tiered rate structure for metered residential customer use. Usage above the base amount (Tier 1) is billed at a higher rate. The increased block rate structure promotes conservation by incentivizing use below the base amount. Non-Residential accounts (including Irrigation) are charged a constant per-unit cost for water service. In both rate structures, the total unit cost is the summation of commodity and capacity costs.

### PUBLIC EDUCATION AND OUTREACH

As part of its water conservation and efficiency efforts, EGWD has hosted a Citizens Water Academy in 2025 and 2026 which offers current customers and landowners a unique opportunity to learn about our most precious natural resource and how EGWD manages it. Participants gain insight into the entire water treatment process, from sourcing and treating water to delivering it to customers. They also learn about the costs involved, including infrastructure maintenance, energy expenses, and regulatory compliance. This in-person, interactive program allows customers to engage directly with EGWD staff, offering a behind-the-scenes look at District operations.

EGWD also implements a public information program through active participation in the Regional Water Authority (RWA) Water Efficiency Program. In collaboration with several water provider members and other wastewater, stormwater, and energy partners, RWA formed the Water Efficiency Program (WEP, or Program) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities. The WEP operates on an average annual budget of \$610,000 and is supplemented by grant funding. Grants are an important funding resource for the Program. Since 2003, the Program has been awarded \$19.9 million in grant funding for public outreach and education as well as a variety of rebate programs, fixture direct install programs, system water loss, individualized customer usage reports, large landscape budgets, and more. Of those funds, \$6.7 million was awarded between 2021 and 2025.

The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water supplier members. The Program distributes these messages on a regional scale through regional media and advertising buys and was honored with the United States Environmental Protection Agency WaterSense Partner of the Year award in 2021 along with three Public Relations Society of America (PRSA), California Capital Chapter awards in 2023/2024 for WEP's public outreach and school education programs. From 2021-2025, the WEP created a series of public outreach campaigns. Below is a summary of each campaign and highlighted achievements.

2021 was a year for nimble messaging and maximum flexibility to adapt outreach to the rapidly changing conditions. RWA's WEP began 2021 with a focus on household leaks and then transitioned to the fourth year of an award-winning outreach campaign focused on tackling the landscape overwatering problem by encouraging residents to check soil moisture before turning on sprinklers (Check & Save). With the sudden emergence of drought in May 2021, the program introduced new creative and tools for WEP participants. The goal: Help provide consistent and actionable tips region-wide while providing flexibility for RWA members to customize materials to reflect their unique water supply situation and call to action.

As the drought grew more serious through late 2021 and into 2022, the WEP updated messaging again and ramped up outreach, asking residents to reduce lawn watering while continuing to water trees (Stress Your Lawn, Save Your Trees), understanding that lawns can handle less water but that drought-stressed trees can be lost forever. This messaging supported the Governor's request of water suppliers to voluntarily reduce water use by 15 percent. Additionally, the WEP continued to partner with the Sacramento Tree Foundation to help educate residents and business on how to maintain and expand the region's healthy tree canopy and included a series of co-branded educational videos and materials.

After the drought subsided in 2023, the WEP launched a new multi-year outreach program aimed at encouraging water efficiency during a non-drought year. Research indicates that public engagement in water conservation tends to surge during drought periods, such as 2022, but declines during non-drought years, like 2023. Consequently, garnering attention and motivating action becomes more challenging during non-drought periods. To tackle this challenge, the 2023 outreach program focused on two main messages:

**SUMMER STRONG**—focused on promoting water-wise best practices outdoors. A Summer Strong yard is tough enough to muscle through the Sacramento region's hottest days and still look its best. The campaign featured eye-catching graphics to promote efficient tree watering, adding low-water and native plants, checking soil moisture, using weather-based sprinkler timers, and watering early to minimize evaporation.

**SUDS WOULD BE DUDS WITHOUT H<sub>2</sub>O**—With clean, reliable water essential to great beer (and to the success of local breweries), the WEP launched a pilot project to partner with local craft brewers, aiming to educate patrons about the importance of water to beer and how to preserve this natural resource. Initial partners included Jack Rabbit Brewing Company and Red Bus Brewing Company, which committed to distributing Be Water Smart materials to their customers. This campaign featured the development of a rebate program to upgrade brewing equipment to be more water efficient and the distribution of coasters, koozies and stickers with water savings messages.

In 2024, the WEP enhanced its existing Summer Strong campaign with the Summer Strong Yard Champs promotion, spotlighting Sacramento-area residents who transformed their landscapes into water-efficient yards. Homeowners nominated yards featuring low-water plants and efficient irrigation systems for a chance to be featured on regional billboards.

Nearly 50 nominations were reviewed, with winners receiving professional photoshoots. Featured yards included a mix of DIY and professionally designed landscapes, all showcasing water-saving practices like low-water and native plants, drip irrigation, and rainwater capture, inspiring others to adopt similar approaches. In 2025, the Summer Strong campaign added a new mascot, Jack LaPlant, an animated plant figure that carried on all the same water savings tips but with refreshed visuals to draw in a new audience. In 2024, the WEP expanded its successful pilot project, Suds Would be Duds without H<sub>2</sub>O, with local craft breweries to raise awareness about water's role in craft beer production and to promote water efficiency. The campaign visited 52 breweries across the Sacramento region. Around 20 breweries are considered active partners, including six of the top craft breweries in the area. Promotional materials, including 10,500 coasters and 7,200 stickers, were distributed by these partners and included water-saving tips and a link to our BeWaterSmart.Info website to access rebates. Additionally, two breweries, Urban Roots Brewery & Smokehouse and Solid Ground Brewing participated in WEP's commercial indoor rebate program. Each brewery received \$15,000 to upgrade or add equipment that reduced water used for chilling and sanitizing processes.

Both campaigns, Summer Strong and Suds Would be Duds without H<sub>2</sub>O, were continued through the end of 2025 and were implemented through both paid advertising buys and earned media from public service announcements (PSAs) and aired in English and Spanish. Every year the campaigns' messaging can be heard on local radio stations such as Capital Public Radio and online through Google, Facebook, and YouTube advertisements. For clarification below, impressions represent how many times an ad was seen.

From 2021-2025, the WEP public outreach campaigns produced:

- Television Advertising  
3,926 television advertisements  
23,212,700 impressions
- Streaming Video Advertising (Comcast, EyeQ, Hearst, Paramount Plus, & Premion)  
3,532,621 advertisements  
3,532,621 impressions
- Radio Advertising  
5,273 radio advertisements  
19,994,200 impressions
- Digital Advertising (Facebook, Google Display Network & Spotify)  
29,472,602 million impressions  
297,870 clicks
- Billboard advertising

2,037,102 digital advertisements  
62,807,653 impressions

- Public Service Announcements (Television and Radio)  
24,248,000 impressions  
\$683,400 in value had they been purchased as advertising
- Facebook  
60 posts per year

The Program continues to utilize our public outreach website, BeWaterSmart.Info, and the “Be Water Smart” brand to reach customers throughout the region. The website, which completed a major redesign and upgrade in 2025, contains customer-specific (enter your address) local water supplier information on rebates and services, general top ways to save for residents and businesses, an interactive watering guidelines and water waste reporting tool, a water-wise plant and gardening database, recent press releases, the Sacramento Smart Irrigation Scheduler tool, and more. Between 2021 and 2025, the website averaged 37,000 unique visitors per year.

For more targeted outreach, the Program distributed quarterly e-newsletters to enrolled residents. The e-newsletters are filled with water savings tips, upcoming events, and region specific articles. They are usually timed around changes in the weather to help signal the need for residents to adjust their irrigation systems, such as daylight savings coupled with a message to dial back/reduce sprinkler systems run times. The e-newsletter reaches 9,361 households.

The WEP selects 2 public events each year to attend as an opportunity for the public to interact with local water efficiency staff. This provides an opportunity for the region to communicate its messages in person. From 2023–2024, WEP attended ECOS Earth Day (April) and the Farm-to-Fork Festival (September).<sup>20</sup> In 2025, the WEP opted to attend the Sacramento Republic Brew Festival (June) instead of the Farm-to-Fork Festival to elevate our existing partnership with Sacramento Republic FC. At these events, the Be Water Smart team provided water-wise tips, encouraged visitors to sign the pledge banner, collected e-mails for those who wish to sign up for the e-newsletter list, as well as identified a customer's water supplier and connected them with rebates and services. Additionally, WEP, in coordination with participating local water suppliers, hosts an annual Mulch Mayhem event (May) in which customers can pick up a truck load of free mulch from selected locations throughout the region.<sup>21</sup> Combined, these in person events are attended by thousands of people each year throughout the region.

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<sup>20</sup>No public events were attended in 2021 and 2022 due to the COVID pandemic.

<sup>21</sup>The 2021 Mulch Mayhem event was held in September due to the COVID pandemic.

The Program provides a variety of “give-a-way” items to customers at in person public events and through direct mail requests from the BeWaterSmart.Info website. From 2021-2025, WEP has distributed thousands of leak detection tablets, moisture meters, garden gloves, and drink koozies to customers to encourage the water savings practices described in our public outreach campaigns and brewery partnerships.

The Program is also highly active in communicating to local media outlets. Between 2021 and 2025, RWA issued 23 press releases on WEP activities and regionally significant news and participated in 17 radio public affairs interviews airing on 18 stations across the Sacramento region’s major commercial radio networks. The RWA and the WEP were mentioned in dozens of news articles published by local and regional media outlets both within and outside of the Sacramento region during the same time frame.

Finally, the WEP partners with professional sports teams in the region to expand the Be Water Smart advertising to new and captive audiences. WEP partnered with the Sacramento River Cats (local Triple – A affiliate of the San Francisco Giants) in 2021, which included our long standing water savings advertisements on all bathroom stall doors as well as 30-second Check & Save spots broadcast on KMAX Channel 31 during each Saturday game and multiple 30-second radio spots broadcast during every game via their streaming radio coverage. The total attendance for regular season games was 342,861. In addition, 24 special events at Sutter Health Park drew 66,300 people in 2021. In 2023, RWEPA launched a new partnership with Sacramento Republic FC (local USL professional soccer team), displaying water-wise messages at games to promote “Summer Strong” yards. The partnership continued through 2025 and included the following activities: a 30-second LED ad, messaging on water refill stations, and giveaways booths at events/games.

To support public outreach messaging and promote water savings tips, the Program also coordinated several regional rebate programs, which were partially or fully funded by state, federal, and private foundation grants. A variety of high efficiency rebate options were provided including toilets, clothes washers, and irrigation efficiencies (full summary in Table 1). Additionally, from August 2023 – November 2025, RWA managed a regional direct installation program, in which a contractor was hired to replace old high use fixtures in multifamily and commercial/institutional properties in disadvantaged communities in the region. Collectively these rebates and direct installations will produce an estimated lifetime (10 years) savings of 7.4 billion gallons of water and 7.9 million kilowatt hours of energy.

**TABLE 4-4. REGIONAL REBATES AND INSTALLATIONS FROM 2021-2025**

Rebate/Installation Type	2021	2022	2023	2024	2025	Lifetime Water Savings 2021-25 (acre-feet)	Lifetime Energy Savings 2021-25 (kWh)**
High Efficiency Clothes Washer Rebates	359	256	307	321	298	229.2	79,309
High Efficiency Toilet Rebates	767	1,275	602	423	326	422.0	145,990
Smart Irrigation Controller Rebates	686	1,049	3,051	556	464	3,652.6	1,264,024
Irrigation Efficiencies Rebates*	5,941	7,153	13,327	11,160	10,321	16,170.6	5,595,912
Turf Replacement Rebates (sq ft)	153,880	239,645	135,607	300,152	266,840	1,244.7	430,711
Toilet Direct Installation	n/a	n/a	584	2,183	1,688	435.5	150,671
Showerhead Direct Installation	n/a	n/a	562	1,766	1,532	605.2	209,475
Faucet Aerators Direct Installation	n/a	n/a	884	3,215	2,343	63.2	21,850
Urinal Direct Installations	n/a	n/a	n/a	19	40	4.0	1,348
<b>Total Water Savings</b>						<b>22,826.7</b>	<b>7,899,291</b>

\*Includes: pressure regulator equipment, pipe and pipe fittings, drop or low volume equipment, and sprinkler heads or nozzles.

\*\*Regional average of 346 kWh per AF

kWh = kilowatt-hour

n/a = no funding available

Lifetime = 10 years

In addition to public outreach, the Program also coordinates regional school education activities. The RWA-sponsored water efficiency exhibits (\$500,000 sponsorship) opened for viewing in 2021 at the new SMUD Museum of Science and Curiosity (MOSAC) in downtown Sacramento, reflecting years of input by RWA Water Efficiency Program Manager, Amy Talbot, who helped shape the exhibits. The exhibits teach visitors to become a “Home Water Detective,” create their own mix tape from water conserving sounds in “Drop a Beat” and learn about local “Water Champions. MOSAC currently welcomes around 150,000 visitors a year from all over the region.

Since 2012<sup>22</sup>, the Program has hosted the Water Spots Video Contest for high school and middle school students. The WEP provides a new contest theme each year and provides the region’s teacher and students with relevant facts and images to help them develop 30 second video PSAs. The contest themes for 2022 and 2023 were “When in Drought...take action to reduce water use” and “Do Your Part to Be Water Smart” respectively. Students submit their videos to WEP who hosts a panel of local celebrities including Monica Woods from ABC 10 to decide on a first, second and third place winner. The top 10 scoring videos are then posted online for public voting to select a “people’s choice” winner as well. Both teachers and student receive cash prizes, and the winning videos are played at Raley Field during River Cats games and in select movie theaters throughout the region (Example: Century Blue Oaks theatre in Rocklin and Century Laguna 16 in Elk Grove). The winning PSAs are incorporated into the WEP’s media activities as well. The 2022 Grand Prize winner video “Doing Your Part” appeared 2,619 times in theatres and delivered 49,000 impressions. The 2023 Grand Prize winner video “Saving Water” appeared 2,149 times in theatres and delivered 47,000 impressions. Students from about a dozen area schools submitted a total of 54 videos total for the 2022 and 2023 contests.

In late 2023, WEP sunset the Water Spots Video Contest and launched a new school education program, Drip Drop, Hip Hop, in collaboration with NorCal School of the Arts (NorCal Arts), which brings together the worlds of art and sustainability to empower children, families, and communities in the Sacramento region. Funded by a \$300,000 grant from the Capital Region Creative Corps and California Arts Council, Drip Drop, Hip Hop educates students and families about water efficiency through a two-person play and arts-integrated lesson plan. The program is free of charge for primarily Title I schools and community venues in Sacramento, Placer, and El Dorado counties plus the City of West Sacramento. The children receive a shower timer with water-efficiency tips with each classroom visit. Additionally, in 2024 the program developed a 30-second television and radio Public Service Announcement (PSA) showcasing local children spreading the water efficiency message to a broader audience in both English and Spanish. In 2024, the PSA was broadcast 1,205 times in 7 television outlets for a total of 5.6 million impressions for an added value of \$124,250 and 567 times in 17 radio outlets for a total of 1.2 million impressions and an added value of \$45,290. As of the end of 2025, the Drip Drop Hip Hop reached 13,232 students through 509 classroom performances and additional community events in Sacramento, Placer, and El Dorado counties. Teachers reported increased water conservation knowledge and that students shared the information with their families.

Implementation of this DMM is active and ongoing. EGWD plans to continue to work with WEP to develop information and activities aimed at public education and outreach.

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<sup>22</sup>The program did not host a Water Spots Video Contest in 2021 due to the COVID pandemic.

### PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS

The District conducts annual Distribution System Water Audits (consistent with AWWA M36 methodology using software analysis) to characterize water system losses. The District's reported distribution system losses are presented in **Table 4-3**. Leak detection methods utilized by the District include monitoring of zone usage, zone pressure, and surface conditions. The District also has a long-term Capital Improvement Program (CIP) that replaces aging water mains. The District validates its water audit data annually to improve the accuracy of actual measured water losses occurring in the system per AWWA M36 methodology.

### WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT

The District's Program Manager Department is responsible for overseeing the District's water conservation efforts. Key responsibilities include:

- Implementing EGWD's Water Conservation Program
- Pursuing available grant opportunities
- Tracking and monitoring State and Federal legislation that may impact conservation efforts
- Collaborating with the RWA WEP Advisory Committee to develop and implement beneficial water efficiency programs
- Developing, implementing, and conducting the District's Public Outreach Program

The Program Manager Department has been fully staffed since fiscal year 2016-17 and received annual funding since that time. The fiscal year 2025-26 budget for the Program Manager Department is approximately \$375,000. The funding supports activities such as meeting conservation targets, monitoring relevant legislation, updating risk-related planning documents, and conducting public outreach.

### OTHER DEMAND MANAGEMENT MEASURES

In addition to the foundational measures discussed previously, the District actively promotes demand management and water efficiency through several other measures.

### A HOMEOWNER'S GUIDE TO A WATERSMART LANDSCAPE

The District provides the A Homeowner's Guide to a WaterSmart Landscape guide to inform customers on conservation, including developing efficient landscapes. Tips on water efficient design, efficient irrigation, climate appropriate plants, appropriate maintenance and irrigation management are provided in the guide. The guide is offered to all customers at no charge.

### WATER USE AUDIT

The District offers free landscape irrigation water use audits to customers. A certified technician evaluates the customer's irrigation system and prepares a report summarizing

opportunities to increase irrigation efficiency. The District also offers indoor evaluations aimed at identifying inefficiencies. These audits allow customers to better understand conservation opportunities and efficient water use.

### 4.3.2. RECENT DMM ACTIVITIES

The District implements a robust suite of other demand management measures as described above, both within the District and as a part of the RWA WEP. The District’s water efficiency programs are available and tailored to both residential and commercial customers.

### 4.3.3. PLANNED DMM ACTIVITIES

In support of its commitment to ongoing water conservation and proactive demand management, the District is developing a new set of programs and actions to achieve water use objectives in compliance with CWC §10609.20. The District will allocate resources in its budget to support demand management activities that advance compliance with objectives. Special consideration will be given to evolving urban water use patterns within the service area.

## 4.4. FORECASTING CUSTOMER USE

Forecasting future water demand begins with an understanding of existing customer demand and trends, recognition of anticipated growth, and consideration of the factors that will influence water use for both existing and future customers over time, particularly those that affect water use efficiency.

Pursuant to CWC §10610.4(c), an urban water supplier “shall be required to develop water management plans to actively pursue the efficient use of available supplies.” A key challenge in meeting this directive is determining how best to incorporate the pursuit of efficient water use into demand forecasts, which serve as the foundation of effective planning. Accordingly, projected water use for both existing customers and those added over the 25-year planning horizon should reflect expected improvements in water use efficiency.

### 4.4.1. REPRESENTING CURRENT CUSTOMER WATER USE

**Table 4-1** and **Table 4-2** provide the actual customer water use for 2021 through 2025 by classification. From this information, an estimate of the representative “current” water use by existing customers has been developed. Knowing that actual use by existing customers varies slightly year-to-year based on a variety of factors (e.g., total rainfall and the timing of spring rain events impacting when landscape irrigation may begin), the recent data provides a basis for estimating current water use.

The target total ‘current water demand’ was estimated using customer-type demand factors and 2025 connections by classification to generate a comparable estimate. This representation of current water use provides the foundation for projecting the future needs of

these existing customers. **Table 4-5** presents the representative monthly and annual current water use, including distribution system losses.

**TABLE 4-5. REPRESENTATIVE CURRENT WATER USE (ACRE-FEET)**

Use Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Residential	240	230	250	290	400	540	620	610	580	500	380	270	4,910
Non-Residential	50	40	50	60	110	170	200	210	190	170	110	60	1,420
Subtotal	290	270	300	350	510	710	820	820	770	670	490	330	6,330
Loss	14	13	15	17	25	35	40	40	38	33	24	16	310
<b>Total</b>	<b>304</b>	<b>283</b>	<b>315</b>	<b>367</b>	<b>535</b>	<b>745</b>	<b>860</b>	<b>860</b>	<b>808</b>	<b>703</b>	<b>514</b>	<b>346</b>	<b>6,640</b>

#### 4.4.2. FACTORS AFFECTING FUTURE CUSTOMER USE

There are several factors that affect the forecast of future customer use, ranging from State and local landscape regulations, building code requirements, and other water-use mandates, to changes in the types of housing products being offered. These factors are incorporated into determining appropriate per-dwelling unit or per customer connection water demand values for use in forecasting future water needs. Relevant characteristics of the factors are described here.

#### WATER CONSERVATION DIRECTIVES

In 2009, Governor Arnold Schwarzenegger signed Senate Bill No. 7 (SBX7-7), which established a statewide goal of achieving a 20 percent reduction in urban per capita water use by 2020 for urban retail water suppliers.<sup>23</sup> As presented previously, the District has met and maintained this mandated target.

Furthermore, the efforts undertaken by the District and its customers to meet these targets, as well as efforts throughout the State by other urban retail suppliers, have changed the availability and use of appliances, fixtures, landscapes and other water using features, through changes or additions to ordinances and/or through a continuing “conservation ethic.”

#### URBAN WATER USE OBJECTIVES

In response to the recent multi-year drought conditions, Governor Brown issued Executive Order B-37-16 in May 2016 entitled “Making Water Conservation a California Way of Life.” In May 2018, Governor Brown signed into law SB 606 and AB 1668, which imposed additional statutory requirements above and beyond the 20 percent by 2020 target reflected in the 2009 legislation.

<sup>23</sup> CWC §10608.20.

The Urban Water Use Objective is comprised of five components representing the aggregate amount of water that would be used if all water in the supplier's service area were used efficiently. These components include:

- Residential Indoor Water Use: Statewide per capita standard<sup>24</sup> multiplied by the supplier's service area population.
- Residential Outdoor Water Use: Landscape area multiplied by an ET-based standard incorporating principles of the Model Water Efficient Landscape Ordinance.
- CII with Dedicated Irrigation Meters Outdoor Water Use: Commercial, Industrial, and Institutional landscapes served by dedicated irrigation meters (CII DIM) using ET-based standards.
- Water Loss: Based on the District's submitted water loss audit, the State Water Resources Control Board has established system-specific water loss standards representing the maximum allowable "real" water loss.
- Variance/Temporary Provisions: Allowances for unique local uses that have a material effect on water use such as significant use of evaporative coolers, livestock watering, seasonal population fluctuations, or high-TDS recycled water irrigation. Temporary Provisions include adjustments due to challenges with wastewater collection, treatment and reuse (Residential Indoor), planting of new, climate-ready trees (Residential Outdoor and CII DIMs), as well as establishment of qualifying landscapes (Residential Outdoor and CII DIMs).

The Urban Water Use Objective and associated regulations are important consideration in projecting District demand as they represent "efficient" water use for the applicable use types.

### REQUIREMENTS IN CALIFORNIA BUILDING CODE

Beginning in January 2010, the California Building Standards Commission adopted the statewide mandatory Green Building Standards Code (hereafter the "CAL Green Code") requiring the installation of water-efficient indoor and outdoor infrastructure for all new projects after January 1, 2011. The CAL Green Code was incorporated as Part 11 into Title 24 of the California Code of Regulations and was revised in 2013 and in 2016 to address changes to the State's Model Water Efficient Landscape Ordinance ("MWELO") adopted during the

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<sup>24</sup> 47 gallons per capita per day (2025 – 2029) and reducing to 42 gallons per capita per day (beginning in 2030).

drought.<sup>25</sup> Revisions to the CAL Green Code in 2019 modified sections to direct users to MWELo regulations contained in other regulatory sections.<sup>26</sup>

The CAL Green Code applies to the planning, design, operation, construction, use and occupancy of every newly constructed or remodeled building or structure. All new residential and non-residential customers must meet the water use requirements of the CAL Green Code as well as the outdoor requirements described by MWELo. The CAL Green Code's requirements generally manifest through: (1) installation of plumbing fixtures and fittings that meet the 20 percent reduced flow rate specified in the CAL Green Code, or (2) by demonstrating a 20 percent reduction in water use from the building "water use baseline." Future customers are expected to satisfy one of these two requirements through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, on-demand water heaters, or other fixtures as well as Energy Star and California Energy Commission-approved appliances.

### **CALIFORNIA MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND COUNTY ORDINANCE**

The Water Conservation in Landscaping Act was enacted in 2006 and has since been revised and expanded multiple times by DWR resulting in today's MWELo. In response to Governor Brown's executive order dated April 1, 2015, (EO B-29-15), DWR updated the MWELo and the California Water Commission approved the adoption and incorporation of the updated State standards for MWELo on July 15, 2015. MWELo requires a retail water supplier or a county to adopt the provisions of the MWELo or to enact its own provisions equal to or more restrictive than the MWELo provisions.

The changes included a reduction to 55 percent of reference evapotranspiration rates for the maximum amount of water that may be applied to residential landscapes, and non-residential projects to 45 percent, which effectively reduces the landscape area that can be planted with high water use plants, such as turf. For residential projects, the allowable maximum coverage of high-water use plants is reduced to 25% of the landscaped area (down from 33%). The newly updated MWELo also now applies to new construction with a landscape area greater than 500 square feet (the prior MWELo only applied to landscapes greater than 2,500 square feet).<sup>27</sup>

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<sup>25</sup> The 2016 Triennial Code Adoption Cycle consisted primarily of the MWELo updates adopted in response to the drought. Indoor infrastructure changes were limited to some minor non-residential fixture changes and changes to the voluntary Tier 1 and Tier 2 requirements. Additionally, the Code was updated to match the new Title 20 Appliance Efficiency Regulations.

<sup>26</sup> The 2019 updated sections to direct CAL Green code users to Title 23 of the California Code of Regulations to allow Title 23 to be the sole location of MWELo requirements.

<sup>27</sup> Government Code §§65591-65599.

### METERING, VOLUMETRIC PRICING, AND WATER BUDGETS

CWC §525 requires water purveyors to install meters on all new service connections after January 1, 1992. CWC §527 requires water purveyors to charge for water based upon the actual volume of water delivered if a meter has been installed. This action alone is not expected to substantially reduce water use. However, it is anticipated that the retail billing system will encourage and help maintain reasonable use (e.g., through implementation of a tiered rate structure and/or water budgets), so that individual customer demand is not expected to increase over time.

### PROHIBITION ON NON-FUNCTIONAL TURF

CWC §10608.14 prohibits the use of potable water to irrigate “non-functional turf” for commercial, industrial, institutional, as well as on properties of homeowners’ associations, common interest developments, and community service organizations or similar entities. This restriction has the potential to reduce overall water use associated with the District’s landscape irrigation customers and effects of this regulation are incorporated into the demand projections.

### 4.4.3. CUSTOMER WATER USE FORECAST

The following subsections detail the assumptions used to forecast customer water use and gross water needs for EGWD’s water service area, separated into the needs of (a) existing potable water use customers, and (b) new potable water use customers.

#### EXISTING CUSTOMER FUTURE USE

To be conservative and assure the analysis of water system reliability is adequate (see Chapter 5), the District is maintaining the annual “current” customer demand as shown in **Table 4-5** (above), where total annual customer demand is 6,300 acre-feet, and production needed is just over 6,600 acre-feet when considering system losses.

While existing customers may undertake a variety of conservation measures – actively through decisions to modify behavior or water use, or passively through the purchase of appliances and fixtures that simply use less water – they may also maintain their use as-is. Holding the current use as a constant for all existing customers into the future will provide a conservative number that can be re-evaluated prior to the 2030 UWMP.

#### NEW CUSTOMER FUTURE USE

As detailed in Chapter 2, the District anticipates continued growth with an associated increased demand placed upon the District’s water supplies. Forecasting the needs of these future customers is dependent upon the type and number of customers, and the unit water demand factors associated with each customer type.

For this UWMP, two distinct customer classifications are used: (1) residential, and (2) non-residential. Residential customers will include both single-family dwelling units built under a variety of densities and multi-family residential dwelling units. Non-residential uses are

expected to include a blend of commercial, institutional, industrial and active landscapes, such as parks, in ratios similar to the District’s current residential-to-non-residential customers.

Values developed for each distinct land use are based on several sources of information, details of which are provided in the following subsections.

**NEW RESIDENTIAL CUSTOMER WATER USE**

**Table 2-5** summarized the District’s anticipated new residential growth over the UWMP planning horizon. **Table 4-6** provides the split among single-family and multi-family through 2050 consistent with existing ratios. This growth provides the basis for the estimated future customer water needs, as the non-residential customers will be a ratio of the new residential customers. **Table 4-6** presents the relevant cumulative growth information.

**TABLE 4-6. ANTICIPATED NEW RESIDENTIAL DWELLING UNITS (FROM TABLE 2-5)**

Use Category	2030	2035	2040	2045	2050
Residential	426	1,196	1,225	1,283	1,371
Single Family	381	1,071	1,096	1,148	1,227
Multi-Family	45	125	128	135	144

The District anticipates these new residential elements will be built in accordance with all applicable building codes including the Cal Green Code discussed previously, and relevant local ordinances.

Distinct demand factors are provided for the following residential uses:

- Indoor Residential Use – this category identifies the generally anticipated water use for single-family and multi-family dwelling units.
- Outdoor Residential Use – this category addresses the landscape water demands commonly anticipated for the single-family and multi-family dwelling units.

For purposes of this UWMP, residential unit water demand factors are described as “the acre-feet of water use annually per dwelling unit” – or acre-feet/dwelling unit (“af/du”).

Residential indoor water demands are conservatively estimated using a representative gallons-per person per day value, explained below, multiplied by the assumed occupancy rates for anticipated residential densities for single-family or multi-family classifications in the District. CWC §10609.4(a) formerly established a standard per-person rate of 55 gallons per day assumed to estimate indoor residential water use targets. However, on January 1, 2023, this standard was amended pursuant to legislative changes associated with Senate Bill 606 and Assembly Bill 1668 to reflect a per-person rate of 47 gallons per capita (i.e., per person) per day (“gpcd”) value. Similarly, this value was previously required to drop to 50

gpcd by 2030, which has since been amended to 42 gpcd within the same time frame.<sup>28</sup> Notably, it is likely that new homes built during this UWMP planning period will be more efficient than 42 gpcd, as analyses of residential water meter data indicate new suburban single-family dwelling units and older homes retrofitted with new water efficient fixtures and appliances are capable of achieving this value.<sup>29</sup>

Based on this per-capita assumption, the following indoor per-dwelling unit value is assumed for each new residential unit:

- Single Family residential indoor use:
  - [2025 – 2030] 0.185 acre-feet per year based upon an assumed occupancy of 3.51 people per unit and a Residential Indoor Standard of 47 GPCD.
  - [2030 and beyond] 0.165 acre-feet per year based on assumed occupancy of 3.51 people per unit and a Residential Indoor Standard of 42 GPCD.
- Multi-family residential indoor use:
  - [2025 – 2030] 0.132 acre-feet per year based upon an assumed occupancy of 2.50 people per unit and a Residential Indoor Standard of 47 GPCD.
  - [2030 and beyond] 0.118 acre-feet per year based on assumed occupancy of 2.50 people per unit and a Residential Indoor Standard of 42 GPCD.

Outdoor residential water use is primarily a factor of lot size and the type and extent of landscaped area and is governed by MWEL. The District’s anticipated growth will likely include a range of residential densities (e.g., houses per acre) that will mimic the range of existing housing densities.

For purposes of this UWMP, each new single-family residential unit is anticipated to have a total gross area of 7,000 square-feet, with 3,500 square-feet anticipated to be irrigable after accounting for the home footprint, driveways, walkways, other hardscapes, and non-irrigated areas. Multi-family units, which typically have shared common landscape areas, are assumed to have 400 square-feet of irrigable area per unit.

Outdoor demands for new residential dwelling units are calculated based on regulations defined under MWEL. MWEL provides for determining the Maximum Applied Water Allowance (MAWA) where the maximum is calculated as 55 percent of the reference

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<sup>28</sup> CWC §10609.4(a)(3)

<sup>29</sup> Zanjero has evaluated meter data from several water purveyors around California which confirms that some of the newest homes under the existing efficiency requirements are already meeting this efficiency goal.

evapotranspiration for the area for every square foot of landscaped area, resulting in the following equation:

*MAWA = (ETo)(0.62)(0.55 x LA), where ETo is the reference evapotranspiration in inches per year, and LA is the landscape area in square-feet. 0.62 is a conversion factor to gallons. The resulting value is in "gallons per year."*

A primary factor in this calculation is evapotranspiration ("ET"). The methodology directs the use of ET from a reference crop, such as maintained grass – a value referred to as ETo. For this UWMP, the ETo is 51.11 inches per year (4.26 feet per year).<sup>30</sup>

Using the MAWA equation, outdoor demand factors for each residential lot category are calculated:

- Single-Family Residential:
  - [2025 – 2030] 0.185 af/du for indoor plus 0.188 af/du for outdoor combines for an annual demand factor of 0.373 af/du.
  - [2030 and beyond] 0.165 af/du for indoor plus 0.188 af/du for outdoor combines for an annual demand factor of 0.353 af/du.
- Multi-Family Residential:
  - [2025 – 2030] 0.132 af/du for indoor plus 0.021 af/du for outdoor combines for an annual demand factor of 0.153 af/du.
  - [2030 and beyond] 0.118 af/du for indoor plus 0.021 af/du for outdoor combines for an annual demand factor of 0.139 af/du.

### NEW NON-RESIDENTIAL CUSTOMER WATER USE

Non-residential per-connection demand factors were also estimated for purposes of forecasting the water needs of anticipated commercial, institutional, industrial and irrigated landscape customers.

However, since the District does not record water use unique to each non-residential connection classification, a weighted average of the total non-residential connections (see **Table 2-1**) and the recorded non-residential use was calculated to be representative of future per-connection water needs. For purposes of this 2025 UWMP, this was determined to be 2.38 acre-feet per connection (informed on recent averages with adjustments). This unit factor is 5% lower than the unit factor incorporated into the District's 2020 UWMP to reflect the restrictions on non-functional turf pursuant to CWC §10608.14.

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<sup>30</sup> See Chapter 2, Section 2.2 Service Area Climate.

The resulting forecast for future water use of existing and new non-residential customers is provided in **Table 4-7**.

#### 4.4.4. SUMMARY OF FORECAST WATER USE

Based upon the estimated water use of existing and new customers, the District anticipates a minor increase in potable water use over the planning horizon. **Table 4-7** presents the resulting customer water use forecast. Although the forecast is presented on an annual basis in 5-year increments through 2050, the monthly pattern is expected to mimic the current monthly pattern detailed in prior tables. This characterization is important when evaluating the District’s water service reliability as detailed in Chapter 5.

**TABLE 4-7. FORECAST FUTURE WATER USE (VALUES IN ACRE-FEET PER YEAR)**

Use Category		2030	2035	2040	2045	2050
Existing	Residential	4,910	4,910	4,910	4,910	4,910
	Non-Residential	1,420	1,420	1,420	1,420	1,420
New	Residential	149	396	405	425	454
	Non-Residential	45	126	128	135	145
Total	Residential	5,059	5,306	5,315	5,335	5,364
	Non-Residential	1,465	1,546	1,548	1,555	1,565
	Water Loss <sup>1</sup>	336	353	354	355	357
	<b>Total</b>	<b>6,860</b>	<b>7,205</b>	<b>7,217</b>	<b>7,245</b>	<b>7,286</b>

<sup>1</sup>Projected water loss values reported in the table represent the targets based on the State’s computed water loss standard (as a percent of water supplied) applicable to the District over the planning period.

#### 4.4.5. DRY YEAR ADJUSTMENTS

The demand forecasts presented in the prior subsection represent expected water needs under normal hydrologic conditions. To credibly forecast potential maximum future water use, the forecasted normal-year water uses must be modified to reflect anticipated increases in demand during drier conditions.

Conservative modifications to the forecasted normal-year water use are warranted to better reflect conditions during dry and critically dry years to support the evaluation of water service reliability in Chapter 5. For purposes of this UWMP, the following adjustment is made:

- Single dry year: Landscape irrigation needs would increase to reflect the generalized earlier start of the landscape irrigation season due to limited rainfall in the single driest year. Since this increase only applies to the outdoor portion of a customer’s forecast use, an adjustment factor of 5% is applied to the total normal-year forecasts to conservatively reflect the expected increase in demand for water for landscaping.

- Multiple dry years: During multiple dry years, demands are expected to increase similarly to a single dry year. For multiple dry year conditions, the single dry year increase of 5% is held in each of the subsequent years. This is representative of an “unconstrained demand” as should be used when evaluating whether Water Shortage Contingency Plan actions may be warranted.<sup>31</sup>

These values are reflected in tables provided for the Drought Risk Assessment and Annual Reliability Assessment presented in later subsections.

### 4.4.6. CLIMATE CHANGE CONDITIONS

Including climate change analysis into this water use analysis will assist the District in understanding the potential effects on long-term reliability, which in turn, allows the District to proactively begin planning appropriate responses. As an example, hotter and drier weather may lead to an increased demand in water for landscape irrigation, especially during spring and fall months, increasing the pressure on water supplies that may have availability restrictions during these periods. Chapter 2 provides a more detailed discussion of potential effects of climate change on the District’s supplies and customer water needs.

The potential for water needs to be higher is reflected in the consideration of the single dry year increase of 5% that is used for the water service reliability analysis, as discussed previously. Whether the elevated single dry year water forecast becomes more akin to the “normal” demand will become more apparent as the District continues to assess monthly water use trends throughout its service area.<sup>32</sup>

## 4.5. PROJECTING DISADVANTAGED COMMUNITY WATER USE

Pursuant to CWC §10631.1, retail suppliers are required to include the projected water use for lower income households. Per California Health and Safety Code §50079.5, a lower income household has an income below 80 percent of area median income, adjusted for family size. For purposes of this UWMP, annual median income was derived from 2024 U.S. Census Bureau information and determined to be about \$120,958 for the District.<sup>33</sup> Therefore, 80% of this is estimated to be about \$96,766 per year. According to the detailed data, approximately 39% of the households earn at or below this 80-percentile income.

For purposes of estimating the future water needs, 39% of the total single-family and multi-family connections are presumed to represent disadvantaged households, resulting in about

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<sup>31</sup> CWC §10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment.

<sup>32</sup> A closer assessment of the correlation of monthly water use by customer type to rainfall and temperature will help the District improve water use forecasts to assure the effects of climate change are adequately being reflected in water service reliability analyses.

<sup>33</sup> <https://censusreporter.org/profiles/16000US0622020-elk-grove-ca/>

29% of the future total potable water use. Applying this condition to the forecast water use for the entire District results in the estimate provided in **Table 4-8**.

**TABLE 4-8. ESTIMATED LOW-INCOME WATER USE FORECAST (ACRE-FEET)**

Year	2030	2035	2040	2045	2050
Total Potable Use	6,860	7,205	7,217	7,245	7,286
Low Income Use	1,951	2,046	2,050	2,057	2,068
% of Total Potable	28.44%	28.40%	28.40%	28.39%	28.39%

# CHAPTER 5

## WATER SYSTEM RELIABILITY

This chapter provides the Elk Grove Water District’s water system reliability findings as required under CWC §10635 and provides reliability information that the District may use in completing an annual supply and demand assessment pursuant to CWC §10632.1.

Assessing water service reliability is the fundamental purpose for the District in preparing its 2025 UWMP. Water service reliability reflects the District’s ability to meet the water needs of its customers under varying conditions. The District’s 2025 UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact the District’s water supply and its customers’ water use. The reliability assessment looks beyond past experience and considers what could be reasonably foreseen in the future. This chapter synthesizes the details imbedded in Chapters 3 and 4 and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents the District’s system reliability findings:

- Five Year Drought Risk Assessment: The 2026 through 2030 Drought Risk Assessment (DRA) for the District’s service area.
- Long-Term Service Reliability: The reliability findings for a Normal Year, Single Dry Year, and Five Consecutive Drought Years in five-year increments through 2050.

In short, the District has reliable water supplies available for its service area through 2050.

### 5.1. FIVE YEAR DROUGHT RISK ASSESSMENT

The Drought Risk Assessment (DRA) requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years. The District has prepared an assessment of the water supplies and demands for its system.

The District is in a unique position to have ample water supplies to meet current and growing customer demand. Specifically, with the buffering capacity over time of the groundwater basin and its stability coupled with the SCWA contract (see Chapter 3), the District is not susceptible to drought conditions. Nevertheless, the District continues to encourage its customers to use water efficiently through proactive outreach (see Chapter 4). Although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California, may require the District to reduce its water service to its customers. **Table 5-1**

below shows the District’s DRA that integrates its supplies for 2026 through 2030 as described in Chapter 3 and reflects the dry year unconstrained water uses described in Chapter 4. As the table shows, the District has sufficient water assets available through the DRA timeframe.

**TABLE 5-1. FIVE YEAR DROUGHT RISK ASSESSMENT**

	2026	2027	2028	2029	2030
Supply	13,000	13,000	13,000	13,000	13,000
Demand	7,018	7,065	7,111	7,157	7,204
Difference	5,982	5,935	5,889	5,843	5,796

## 5.2. LONG TERM SERVICE RELIABILITY

The UWMPA directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. DWR recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle.

### 5.2.1. EGWD LONG TERM SERVICE RELIABILITY

The District’s long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 through 2050.

#### NORMAL AND SINGLE DRY CONDITIONS 2030–2050

The District’s future water supplies in normal and single dry conditions reflect the same conditions described for the DRA and as detailed in Chapter 3. Specifically, the District has sufficient and reliable water supplies to meet forecast customer water needs through 2050 considering water use forecasts for both normal and dry condition. All of this information is detailed in Chapter 4 and reflected in the numbers shown in the tables below. **Table 5-2** shows the normal year supplies and demands on an annual timestep from 2030 through 2050.

**TABLE 5-2. NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (ACRE-FEET PER YEAR)**

Normal Year	2030	2035	2040	2045	2050
Supply	13,000	13,000	13,000	13,000	13,000
Demand	6,860	7,205	7,217	7,245	7,286
Difference	6,140	5,795	5,783	5,755	5,714
Single Dry Year	2030	2035	2040	2045	2050
Supply	13,000	13,000	13,000	13,000	13,000
Demand	7,204	7,565	7,578	7,607	7,650
Difference	5,796	5,435	5,422	5,393	5,350

**FIVE CONSECUTIVE DRY YEARS 2030-2050**

The District defines a drought condition lasting five consecutive years as one that requires the District to reduce water service to its customers. The District's groundwater supplies coupled with its contract supplies from SCWA have limited constraints in dry years and are considered reliable. However, although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California, may require the District to reduce its water service to its customers. Nevertheless, the District assumes that these conditions that would require less water supply deliveries to the District's customers do not manifest in assessing the supply availability in the future.

The District also assumes that dry year demand conditions would remain unconstrained during the dry conditions causing a slight increase in the actual demand from District's customers. This characterization of water demands provides a conservative estimation of demand conditions in a five-year drought scenario. Together, the supply availability as paired against the slightly increased demand conditions demonstrate that the District has sufficient supplies to meet five consecutive dry year conditions through 2050. **Table 5-3** below shows the annual water supply and demand conditions in five consecutive dry years from 2030 through 2050.

**Table 5-3** below shows the annual water supply and demand conditions for the District's service area in five consecutive dry years from 2030 through 2050.

**TABLE 5-3. FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (ACRE-FEET PER YEAR)**

		2030	2035	2040	2045	2050
Year 1	Supply	13,000	13,000	13,000	13,000	13,000
	Demand	7,204	7,565	7,578	7,607	7,650
	Difference	5,796	5,435	5,422	5,393	5,350
Year 2	Supply	13,000	13,000	13,000	13,000	13,000
	Demand	7,276	7,568	7,584	7,616	7,659
	Difference	5,724	5,432	5,416	5,384	5,341
Year 3	Supply	13,000	13,000	13,000	13,000	13,000
	Demand	7,348	7,570	7,590	7,624	7,676
	Difference	5,652	5,430	5,410	5,376	5,324
Year 4	Supply	13,000	13,000	13,000	13,000	13,000
	Demand	7,420	7,573	7,596	7,633	7,684
	Difference	5,580	5,427	5,404	5,367	5,316
Year 5	Supply	13,000	13,000	13,000	13,000	13,000
	Demand	7,493	7,576	7,601	7,641	7,684
	Difference	5,507	5,424	5,399	5,359	5,316

### 5.3. WATER SUPPLY RELIABILITY SUMMARY

The District’s water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050.

# CHAPTER 6

## WATER SHORTAGE CONTINGENCY PLAN

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The Elk Grove Water District (EGWD) is committed to meeting the health and safety requirements of a drinking water purveyor at all times. EGWD maintains this Water Shortage Contingency Plan (WSCP) to help meet this goal during water shortages.

This WSCP provides for emergency water supply management related to general supply shortages due to severe droughts, infrastructure failure, catastrophic supply interruption, or any other cause. EGWD coordinates regionally through Regional Water Authority (RWA) and Sacramento County Water Agency (SCWA) with respect to emergency water shortage planning and response.

This WSCP allows for declaration of supply shortages by the Board of Directors (Board). When a shortage is identified, the Board assesses if a particular shortage stage (and corresponding response actions) should be declared. Upon Board declaration of a shortage stage, restrictions, regulations, prohibitions on uses, and enforcement measures are enacted.

### 6.1. LEGAL AUTHORITIES

The Florin Resources Conservation District, established and governed by Division 9 of the California Public Resources Code (PRC), owns and operates a water utility called the Elk Grove Water District. EGWD's authority includes the "development and distribution of water" (PRC 9151) and is authorized to manage and administer any water conservation or distribution project within or adjacent to EGWD (PRC §9415). Upon approval by the Board of Directors, EGWD is authorized to include plans and specifications that include terms and conditions with respect to conservation of water (PRC §9816).

The aforementioned powers derived from EGWD's organizing statutes are in addition to general powers granted to water distributors in CWC §§350–359. CWC §350 authorizes the governing body of a distributor of a public water supply to declare a water shortage emergency whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent there would be insufficient water for human consumption, sanitation, and fire protection. Upon a finding of such an emergency condition, the distributor can adopt such regulations and restrictions on the delivery and consumption of water as will conserve the water supply for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection (CWC §353). The regulations and restrictions remain in force and effect until the supply of water available for distribution within such area has been

replenished or augmented, and restrictions may include the right to deny new service connections and discontinue service for willful violations (CWC §355 and §356).

EGWD also coordinates with any city or county within which it provides water supply services for the possible proclamation of a “local emergency” under California Government Code, California Emergency Services Act (Article 2, Section 8558).

## 6.2. WATER SUPPLY RELIABILITY ANALYSIS

EGWD supply consists of both self-supplied groundwater as well as purchased supplies from Sacramento County Water Agency (SCWA). EGWD’s Service Area 1 relies on production of groundwater, whereas Service Area 2 relies on purchased supplies from SCWA. Both supply sources can be impacted by climate factors, catastrophic events, and regulatory measures. EGWD evaluates its overall water supply reliability through its Urban Water Management Plan, as well as through other regional and SCWA planning efforts.

EGWD’s groundwater supplies are projected to be available for pumping during drought periods. The groundwater supply is the Sacramento Valley South American Groundwater Basin, referred to as the Central Basin Area of the Sacramento County Groundwater Basin, as identified in the Central Sacramento County Groundwater Management Plan. The Central Basin is sustainably managed by all the region’s pumpers in coordination with the region’s groundwater sustainability agencies. EGWD does not currently project any groundwater shortages during a drought lasting up to five years. However, the ability to pump the groundwater may be limited by regulatory or legal requirements put in place during a drought. EGWD will address these restrictions as they materialize and modify its water shortage supply strategy, as necessary.

EGWD also receives supply from the Sacramento County Water Agency. Although SCWA maintains surface water and groundwater supply for its entire service area, the supply from SCWA is almost entirely from SCWA production wells located within EGWD’s service area. SCWA’s recent planning efforts indicate no expected limitations in its ability to access the water resources used to serve EGWD’s Service Area 2, including during drought conditions. As the case with EGWD’s own groundwater production constraints, this supply may be impacted by regulatory or legal requirements imposed during a drought. EGWD will work with SCWA to address these restrictions and develop the appropriate response strategy, as necessary.

## 6.3. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

EGWD conducts an annual analysis of supply and demand projections to help inform water resources management decisions for the coming year. The analysis incorporates numerous data sources used as evaluation criteria to project probable demands and supply availability for the coming year. Sources to consider include:

- Projected weather conditions
  - Precipitation versus historical on monthly basis

- Projected Unconstrained Demand
  - Production versus historic on monthly basis
  - New customer growth
  - Identify artificially supplied water features separate from swimming pools and parks
  - GPCD tracking
- Projected Supply Availability
  - SCWA projected supply
  - Groundwater production capacity
- Regulatory Conditions
  - State mandated conservation orders
  - Groundwater Sustainability Agency (GSA) information

The general procedure is listed below. EGWD may modify this process based on available data, significant events, process restrictions, or other external factors that may impact the process.

1. Compile existing weather data to characterize past 12 months conditions. During the dry year scenario, the EGWD anticipates no impact in the ability to produce groundwater supplies, including supplies from SCWA.
2. Estimate unconstrained EGWD demands based on recent and representative customer use data. Development of unconstrained demand will incorporate recent use patterns (unit factors for each customer type) and anticipated customer growth.
3. Assess the wholesaler supply based on wholesaler projections for current year and dry year scenarios.
4. Assess available capacity of groundwater production facilities.
5. Identify and incorporate any applicable constraints (infrastructure, regulatory, etc.) regarding receiving wholesaler supply or groundwater production.
6. Compare projected wholesaler supplies and available groundwater production facilities with anticipated EGWD demands.
7. Develop, analyze, and propose water resource management strategies to address the projected demand to supply comparison, including reference to the water shortage stages identified in this WSCP.
8. Present Annual Water Supply and Demand Assessment (and resulting conservation stage declaration, if applicable) to Board.

The general proposed timeline is as follows:

- Begin assessment by District staff – March/April
- Present assessment to Board of Directors – May
- Submit to State per CWC §10632.1 – No later than July 1

## 6.4. WATER SHORTAGE STAGES

The following subsections and tables present information on EGWD's supply scenarios, including Normal Water Supply and the six water shortage stages. Results from the annual Water Supply and Demand Assessment are used to declare a respective shortage stage.

### 6.4.1. NORMAL WATER SUPPLY

EGWD's water supply and distribution system is able to meet all the water demands of its customers in the immediate future. Regulations for Normal Water Supply are applicable to all stages and include the following:

- Runoff – Irrigation shall not be allowed to run off to adjoining properties or to the roadside ditch or gutter.
- Watering after a Rainfall Event – No irrigation shall be allowed for 48 hours after a measurable rainfall event. A measurable rainfall event shall be defined as an event having 0.10 inches of rain in one day.
- Hoses – Open hoses are not permitted. Automatic shutoff nozzles are required.
- Washing driveways and other paved areas – Use of water to clean sidewalks, driveways, patios, or other hardscapes is not permitted. Washing of streets and commercial parking lots with a hose is not permitted, except to alleviate immediate fire or sanitation hazards.
- Pools, ponds, and fountains – All swimming pools, ponds, fountains, or other decorative water feature shall use recirculated water.
- Nonfunction Turf – Using potable water for irrigating nonfunctional turf (ornamental lawns) on commercial, industrial, and institutional properties is prohibited per Assembly Bill 1572

The penalties for water waste during this stage (Normal Water Supply) are as follows:

- First and Second Violation – Customer is notified of a violation.
- Third Violation – Written warning sent to customer.

The following practices are encouraged by EGWD:

- Irrigation – Limit landscape irrigation to not more than 3 days per week.
- Irrigation hours – Landscaping irrigation is discouraged between the hours of 12:00 p.m. and 6:00 p.m. during the summer months (May – October).
- Serving of Water – Restaurants shall serve water to customers only upon request.

- Water Leaks – Leaking pipes, fixtures or sprinklers shall be repaired promptly.

### 6.4.2. STAGE 1 – 10% SUPPLY SHORTAGE

Actions include regulations from Normal stage plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 10 percent gap between supplies and demands.

Stage 1 – 10% Supply Shortage
<p>Customers Actions to Reduce Demand up to 10 Percent</p> <ul style="list-style-type: none"> <li>• Reduce total water use by 10%. Contact EGWD or visit <a href="http://egwd.org">egwd.org</a> for tips and techniques to reduce indoor and outdoor water use.</li> <li>• Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations.</li> <li>• Users of construction water meters will be monitored for efficient water use.</li> <li>• Restaurants shall serve water only upon request.</li> <li>• Pipeline flushing is prohibited except in the case of an emergency, public health and for essential operations or unless specifically authorized by the District.</li> <li>• Addresses ending in an odd number irrigate on Tuesday, Friday, and Sunday. Customers are encouraged to <b>voluntarily</b> reduce irrigation to Tuesday and Friday.</li> <li>• Addresses ending in an even number irrigate on Monday, Thursday, and Saturday. Customers are encouraged to <b>voluntarily</b> reduce irrigation to Monday and Thursday.</li> </ul>
<p>District Actions</p> <ul style="list-style-type: none"> <li>• Communicate mandatory reduction targets to customers.</li> <li>• Leak repair receives higher priority.</li> <li>• Increase drought awareness through additional public outreach measures that notify public and customers for declared stage, requirements, and available conservation program support.</li> <li>• Decrease system flushing frequency.</li> <li>• Increased monitoring of customer use.</li> <li>• Accelerate infrastructure repairs and improvements.</li> <li>• Water Shortage enforcement measures, including fines and charges, for non-compliance with this WSCP’s requirements will be implemented in accordance with established District Policies and Procedures</li> </ul>

**6.4.3. STAGE 2 – 20% SUPPLY SHORTAGE**

Actions include regulations from Stage 1 plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 20 percent gap between supplies and demands.

Stage 2 – 20% Supply Shortage
<p>Treated Water and Municipal Water Customers - Actions to Reduce Demand up to 20 Percent</p> <ul style="list-style-type: none"> <li>• Reduce total water use by 20%. Contact EGWD or visit <a href="http://egwd.org">egwd.org</a> for tips and techniques to reduce indoor and outdoor water use.</li> <li>• Leaking customer pipes or faulty sprinklers shall be repaired within two working days or less if warranted by the severity of the problem.</li> <li>• Water for flow testing and construction purposes from water agency fire hydrants and blow-offs is prohibited. Use of reclaimed water for construction purposes is encouraged. Reclaimed water is not currently available within EGWD’s service area and would have to be obtained elsewhere.</li> <li>• Addresses ending in an odd number irrigate on Tuesday, Friday from 8pm-8am.</li> <li>• Addresses ending in an even number irrigate on Monday, Thursday from 8pm-8am.</li> <li>• Pools, ponds, and fountains – Water use for ornamental ponds and fountains is prohibited. No potable water from EGWD’s system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams until the Stage 2 – Water Warning has been declared over.</li> </ul>
<p>District Actions</p> <ul style="list-style-type: none"> <li>• Communicate mandatory reduction targets to customers.</li> <li>• Implement water conservation patrols.</li> <li>• Reach out to top consumers about conservation measures.</li> </ul>

**6.4.4. STAGE 3 – 30% SUPPLY SHORTAGE**

Actions include regulations from preceding stages plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 30 percent gap between supplies and demands.

Stage 3 – 30% Supply Shortage
<p>Treated Water and Municipal Water Customers - Actions to Reduce Demand up to 30 Percent</p> <ul style="list-style-type: none"> <li>• Reduce total water use by 30%. Contact EGWD or visit <a href="http://egwd.org">egwd.org</a> for tips and techniques to reduce indoor and outdoor water use.</li> <li>• Leaking customer pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem.</li> <li>• Use of reclaimed water for construction purposes is encouraged. Reclaimed water is not currently available within EGWD’s service area and would have to be obtained elsewhere.</li> <li>• Installation of new turf lawn and/or landscaping is prohibited.</li> <li>• Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.</li> <li>• Addresses ending in an odd number irrigate on Tuesday, Friday from 10pm-4am.</li> <li>• Addresses ending in an even number irrigate on Monday, Thursday from 10pm-4am.</li> </ul>
<p>District Actions</p> <ul style="list-style-type: none"> <li>• Communicate mandatory reduction targets to customers.</li> <li>• No commitments will be made to provide service for new water service connections unless the Department of Water Resources Model Water Efficient Landscape Ordinance, found at: <a href="https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance">https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance</a>, is followed and the plans have been approved by the county or city building department which has jurisdiction over the property location. Any authorized landscape for new connections is subject to all restrictions set forth in Stage 3.</li> </ul>

### 6.4.5. STAGE 4 – 40% SUPPLY SHORTAGE

Actions include regulations from preceding stages plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 40 percent gap between supplies and demands.

Stage 4 – 40% Supply Shortage
<p>Treated Water and Municipal Water Customers - Actions to Reduce Demand up to 40 Percent</p> <ul style="list-style-type: none"> <li>• Reduce total water use by 40%. Contact EGWD or visit <a href="http://egwd.org">egwd.org</a> for tips and techniques to reduce indoor and outdoor water use.</li> <li>• No potable water from the District’s system shall be used for construction purposes including but not limited to dust control, compaction, or trench jetting.</li> <li>• Addresses ending in an odd number irrigate on Tuesday from 10pm-4am.</li> <li>• Addresses ending in an even number irrigate on Thursday from 10pm-4am.</li> </ul>
<p>District Actions</p> <ul style="list-style-type: none"> <li>• Communicate mandatory reduction targets to customers.</li> <li>• System Pressure – Maximum psi at wells and treatment plants will be reduced to 55.</li> </ul>

### 6.4.6. STAGE 5 – 50% SUPPLY SHORTAGE

Actions include regulations from preceding stages plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 50 percent gap between supplies and demands.

Stage 5 – 50% Supply Shortage
<p>Customers - Actions to Reduce Demand up to 50 Percent</p> <ul style="list-style-type: none"> <li>• Reduce total water use by more than 50%. Contact EGWD for tips and techniques to reduce indoor and outdoor water use.</li> <li>• Leaking customer pipes or faulty sprinklers shall be repaired immediately. Water service will be suspended until repairs are made.</li> <li>• Turf irrigation is prohibited.</li> </ul>
<p>District Actions</p> <ul style="list-style-type: none"> <li>• Communicate mandatory reduction targets to customers.</li> <li>• New connections - No new connections will be added to the system until the Stage 5 has been declared over.</li> <li>• System Pressure – Maximum system operating pressure will be reduced to 50 psi.</li> </ul>

### 6.4.7. STAGE 6 – OVER 50% SUPPLY SHORTAGE

Actions include regulations from preceding stages plus those listed below. Actions will be identified to address each specific shortage situation to eliminate the gap between supplies and demands.

Stage 6 – Over 50% Supply Shortage
<p>Customers - Actions to Reduce Demand greater than 50 Percent</p> <ul style="list-style-type: none"> <li>• Health and safety use of water only.</li> <li>• Landscape irrigation is prohibited.</li> </ul>
<p>District Actions</p> <ul style="list-style-type: none"> <li>• Communicate mandatory reduction targets to customers.</li> <li>• Other actions as identified specific to the shortage condition.</li> <li>• Declare Water Shortage Emergency in accordance with Section 350 of Division 1, Chapter 3 Water Shortage Emergencies of the California Water Code.</li> </ul>

## 6.5. ENFORCEMENT AND VARIANCES

EGWD provides the stages of penalties for violators of the water waste regulation. The penalties are enforced through the application of FRCD Ordinance No. 06.15.21.02. For each violation within a 12-month period under normal water supply conditions, violations are as follows:

- First and Second Violation – Customer is notified of a violation.
- Third Violation – Written warning sent to customer.

When a conservation stage 1-3 is declared, fines for each violation within a 12-month period are as follows:

- First Violation – Customer is notified of a violation.
- Second Violation – Written warning sent to customer.
- Third Violation – \$200 fine and customer is scheduled for mandatory water audit.
- Fourth Violation – \$500 fine.
- Fifth Violation – \$500 fine and water service is shut off. A Connection fee is assessed to reactivate water service.
- Similar fines and charges may be implemented by EGWD as needed to enforce restriction on specific prohibitions on water uses.

When conservation stage 4 - 6 is declared, fines for each violation within a 12-month period are as follows:

- First Violation – Customer is notified of a violation with a written warning.
- Second Violation – \$500 fine and customer is scheduled for mandatory water audit.

- Third Violation – \$500 fine and water service is shut off. A Connection fee is assessed to reactivate water service.
- Similar fines and charges may be implemented by the District as needed to enforce restriction on specific prohibitions on water uses.

Once a water shortage stage has been declared, EGWD will enforce compliance through a multitude of measures commensurate with each reduction goal. EGWD will either implement measures per this Water Shortage Contingency Plan or will provide further discrete requirements through approval of ordinances.

The appeal process regarding this WSCP is found in Article 5 of Ordinance No. 06.15.21.02.

### **6.6. COMMUNICATION PROTOCOLS**

EGWD maintains an established and effective communications program to inform its customers, neighbors, and other stakeholders of issues, updates, and policies.

Implementation of the WSCP will utilize the existing communication program structure to inform customers and others of the declared shortage stage and respective actions and restrictions in place.

The Board meetings addressing the Annual Water Supply and Demand Assessment and/or a potential water shortage declaration will be noticed per normal Board meeting public notification procedures. The meeting will also be announced through regular press release protocols.

Once a shortage stage has been declared by the Board of Directors, EGWD will notify its customers and others through a range of efforts. The stage and restrictions will be identified in a press release, as well as customer billing statements. EGWD's website will be updated to feature the shortage declaration, restrictions, and resources available to customers from EGWD and other entities to help meet the restrictions. Subsequent Board of Directors meetings will include a review of the shortage condition, customer response results, and discussion and recommendations for potential modifications.

EGWD will also coordinate with the City of Elk Grove, Sacramento County, Sacramento County Water Agency, and Regional Water Authority, to declare a local emergency with respect to anticipated water supplies and demands in the event conditions necessitate.

### **6.7. FINANCIAL CONSEQUENCES OF WSCP**

EGWD understands the potential for decreased revenues and increased costs during prolonged water shortage conditions and enforcement of excessive residential water use during a drought (compliance with Chapter 3.3, Division 1 of the CWC). The decreased revenues can be expected due to a reduction in water sales. Volumetric revenue is

approximately 37 percent of total revenue<sup>34</sup>. Assuming a reduction in sales commensurate with the particular WSCP stage declaration, a decrease in total revenues in the range of 2-4 percent per stage may be expected.

Additional monitoring, public outreach, and enforcement is expected to increase total costs to EGWD in declaring a water shortage. These additional efforts are prioritized for current staff, and other normal work efforts and projects are delayed or reassigned. If conditions warrant, EGWD will seek the assistance through additional staffing from third-party service providers. These costs depend on the level of support and will be evaluated on a case-by-case basis.

EGWD maintains a strong financial management position. However, it is reasonable to expect financial impacts or changes in cash flow during a prolonged water shortage condition. EGWD will enact a range of management and financial resources depending on the specific situation that include:

- Capital project deferment
- Operational and maintenance expense deferment
- Increased revenues from fines and penalties
- And others as identified

### 6.8. MONITORING AND REPORTING

The WSCP aims to ensure demands are reduced and/or supply is augmented to balance supply and demand. EGWD will enact various actions commensurate with each respective stage. EGWD will then monitor results to maintain the supply/demand balance. Similar to the supply and demand projections used to establish a shortage condition, EGWD will monitor the same data to determine effectiveness and efficacy. District staff will report to the Board of Directors at least quarterly on status and results. Data reporting will include:

- Actual demands to projected demands per customer class and on total.
- Actual supply availability and utilized to projected availability per each supply source.
- Projected supply availability for next 12 months per supply source.
- Any specific requirements identified by the State in the future.
- Data will also be submitted to the State per any future reporting requirements.

Progress and efficacy will be summarized from the results data. EGWD will evaluate the need for any changes or modifications to the declared water shortage stage or actions based on the results. EGWD may determine to enact additional measures, develop ordinances, or update the WSCP as a whole. Any WSCP update or modification will be conducted through the Board of Directors meeting process, unless specific conditions require otherwise.

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<sup>34</sup>EGWD's 2024-2028 Water Rate Study Report.

## 6.9. RESPONSE ACTION ESTIMATES

The following table presents the individual estimated demand savings of each response action. Actual savings will likely vary greatly based on external influences, shortage stage level, and general customer understanding of drought severity. It is assumed the savings estimates are not additive, but when implemented together as a program with all the actions in each respective stage, they will eliminate the supply to demand shortage gap.

**TABLE 6-1. SHORTAGE RESPONSE ACTION MEASURES ESTIMATES**

Stage	Shortage Response Action	Potential Shortage Gap Reduction
1	Customer – Asked to reduce total water use by 10%.	up to 10%
1+	Customer – Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations.	0-1%
1+	Customer – Users of construction meters will be monitored for efficient water use.	0-2%
1	Customer – Limit irrigation to three days per week. Asked to voluntarily reduce to two days a week.	3-8%
1+	District – Leak repairs receives higher priority.	0-3%
1+	District – Increase drought awareness through additional public outreach measures that notify public and customers for declared stage, requirements, and available conservation program support.	3-5%
1+	District – Increased monitoring of customer use.	0-1%
1+	District –Accelerate infrastructure repairs and improvements.	0-3%
1+	District – Increased enforcement measures, including fines and charges, for non-compliance with WSCP.	0-4%
1	District - Flushing is prohibited except in the case of an emergency, public health and for essential operations or unless specifically authorized by the District.	0-2%
2	Customer –Reduce total water use by 20%.	up to 20%
2	Customer – Leaking pipes or faulty sprinklers shall be repaired within two working days or less if warranted by the severity of the problem.	0-1%
2	Customer – Irrigation shall be limited to two days per week.	5-15%
2+	Customer – Water use for ornamental ponds and fountains is prohibited. No potable water from EGWD’s system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams.	0-1%
2+	Customer – Water for flow testing and construction purposes from fire hydrants and blow-offs is prohibited.	0-1%
2+	District – Implement water conservation patrols.	3-5%
3	Customer – Reduce total water use by 30%.	up to 30%

## Chapter 6 – Water Shortage Contingency Plan

Stage	Shortage Response Action	Potential Shortage Gap Reduction
3+	Customer – Leaking pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem.	0-1%
3+	Customer – Use of reclaimed water for construction purposes is encouraged. Reclaimed water is not currently available within EGWD’s service area and would have to be obtained elsewhere.	0-1%
3+	Customer – Flushing of sewers and fire hydrants is prohibited except in the case of emergency and for essential operations or unless specifically authorized by EGWD.	0-2%
3+	Customer – Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.	0-1%
3	Customer – Irrigation shall be limited to two days per week (within six-hour block).	15-20%
3+	Customer – Installation of new turf lawn and/or landscape is prohibited.	0-3%
3+	District – No commitments will be made to provide service for new water service connections unless the DWR MWEL0 is followed, and the plans have been approved by the appropriate building department(s).	1-5%
4	Customer – Reduce total water use by 40%	Up to 40%
4	Customer – Irrigation is allowed only once per week (within six-hour block).	20-30%
4	Customer – No potable water from EGWD’s system shall be used for construction purposes including but not limited to dust control, compaction or trench jetting.	0-2%
4	District – Maximum psi at wells and treatment plants will be reduced to 55.	1-4%
5	Customer – Reduce total water use more than by 50%.	Up to 50%
5+	Customer – Leaking customer pipes or faulty sprinklers shall be repaired immediately. Water service will be suspended until repairs are made.	0-1%
5	Customer – Turf irrigation is prohibited.	25-40%
5	District – No new connection will be added to the system.	2-4%
5	District – Maximum system operating pressure will be reduced to 50 psi.	1-4%
6	Customer – Health and safety use of water only.	up to 50%
6	Customer – Landscape irrigation is prohibited.	25-40%
6	District – Other actions as identified specific to the shortage condition.	varies
6	District – Declare Water Shortage Emergency in accordance with Section 350 of Division 1, Chapter 3 Water Shortage Emergencies of the California Water Code.	varies

## 6.10. WSCP REFINEMENT PROCEDURES

EGWD’s WSCP is an adaptive plan that allows for active refinement to particular shortage conditions. The general procedures for refinement are presented below.

1. For each shortage response action, compare expected results with actual shortage response and identify any shortfall or over achievement.
2. Revise expected reduction for a specific shortage response action based on updated information.
3. Assess the aggregate expected reductions (from revised shortage response actions) for each shortage stage.
4. Revise stage declaration or modify stage shortage response actions to balance demands with supplies.

The procedures presented above will be relied upon during all shortage stage declarations, ensuring an adaptive WSCP, capable of being relied upon under various circumstances, is produced.

## 6.11. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

The WSCP (including subsequent updates) shall be adopted in accordance with standard EGWD procedures, including requirements for public participation (public hearing), and approval by the Board. Upon adoption, the WSCP will be submitted to DWR no later than 30 days after and made available for inspection at EGWD office and website.

## 6.12. SEISMIC RISK ASSESSMENT AND MITIGATION PLAN (CATASTROPHIC INTERRUPTION IN SUPPLIES)

Sacramento County has completed a Local Hazard Mitigation Plan (LHMP) under the federal Disaster Mitigation Act of 2000 (Public Law 106-390). Per DWR requirements, a copy of the most recent adopted LHMP applicable to EGWD is included in this UWMP (Appendix B).

Sacramento County is currently in the process of updating the LHMP. The update includes participation with other entities, including Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, Isleton, Rancho Cordova, and other special districts. The update is anticipated to be completed and finalized during 2026. Upon adoption of the LHMP update, EGWD will submit to DWR.

The LHMP 2021 Hazard Identification Assessment for the City of Elk Grove characterizes the earthquake and liquefaction probability as “occasional” (between 1 and 10 % chance of occurrence in the next year or has a recurrence interval of 11 to 100 years) and “unlikely” (less than 1 percent chance of occurrence in the next year or has a recurrence interval of greater than 100 years), respectively. Earthquake and liquefaction significance is listed to be “medium” (moderate potential impact) and “low” (minimal potential impact), respectively.

# **APPENDIX A**

## **ADOPTING RESOLUTIONS**

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## **RESOLUTION NO. 06.16.26.05**

### **A RESOLUTION OF THE BOARD OF DIRECTORS OF THE FLORIN RESOURCE CONSERVATION DISTRICT APPROVING THE WATER SHORTAGE CONTINGENCY PLAN**

**WHEREAS**, the Urban Water Management Planning Act, Water Code sections 10610 through 10657 (the Act), mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually is an urban water supplier obligated to prepare a Water Shortage Contingency Plan (Plan) as part of the 2025 Urban Water Management Plan (UWMP), the primary objectives of which are to plan for the conservation and efficient use of water;

**WHEREAS**, the Florin Resource Conservation District (District) is an urban water supplier under the Act because it provided approximately 6,296 acre-feet of water in 2025 to approximately 44,079 people through approximately 13,229 water service connections;

**WHEREAS**, the District is required by the Act to adopt a final 2025 Plan by no later than July 1, 2026, after staff and consultants have reviewed and amended the previous Plan and after the District Board of Directors (Board) holds a public hearing on the draft updated Plan;

**WHEREAS**, the District has prepared and circulated a draft Plan, as part of the 2025 UWMP, for public review and review by the City of Elk Grove, County of Sacramento, and other interested agencies, and properly noticed a public hearing concerning the Plan, including publication of notice two times in The Elk Grove Citizen as required by Government Code section 6066.

**WHEREAS**, the Board held the required public hearing on the Plan during its regular Board meeting on May 19, 2026, and no written or oral comments concerning the Plan were received from the public or any interested agency; and

**WHEREAS**, in accordance with Water Code section 10652, the preparation of the Plan is deemed not to be a project for purposes of the California Environmental Quality Act (“CEQA”) and therefore, no CEQA review of the Plan was required or conducted.

**NOW, THEREFORE, BE IT RESOLVED** by the Board of Directors of Florin Resource Conservation District as follows:

1. The Board finds that the District’s final draft Water Shortage Contingency Plan dated May 1, 2026, contains all elements required by the Act and hereby adopts the Plan as part of the 2025 UWMP.
2. The General Manager is authorized and directed to file the District’s Plan, as part of the 2025 UWMP, with the California Department of Water Resources, the California State Library, the City of Elk Grove, and the County of Sacramento by no later than July 1, 2026, and to file any Plan amendments with those agencies

within 30 days of adoption of any such amendment.

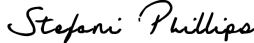
- 3. The General Manager is authorized and directed to implement the water conservation programs and other actions described in the Plan, which includes the water shortage contingency analysis and recommendations to the Board of Directors regarding necessary procedures, rules and regulations to carry out effective and equitable water conservation and water recycling programs.
- 4. The General Manager or his designee will make a copy of the District’s adopted Plan, as part of the 2025 UWMP, available for public review on the District’s website and in the office during normal business hours within 30 days of its adoption.

**PASSED, APPROVED AND ADOPTED** by the Florin Resource Conservation District Board of Directors on this 16th day of June 2026 by the following vote:


**AYES:** Lindsay, Green, Mulberg and Nelson  
**NOES:**  
**ABSENT:**  
**ABSTAIN:**

Signed by:  
  
 3032E5A2B9CB4EF...  
 Paul Lindsay  
 Chair

ATTEST:

DocuSigned by:  
  
 D2033027E97541C...  
 Stefani Phillips  
 Board Secretary

APPROVED AS TO FORM:

Signed by:  
  
 DC8517378883497...  
 Joshua M. Horowitz  
 General Counsel

**RESOLUTION No. 06.16.26.06**

**A RESOLUTION OF THE FLORIN RESOURCE CONSERVATION  
DISTRICT BOARD OF DIRECTORS APPROVING THE 2025  
URBAN WATER MANAGEMENT PLAN**

**WHEREAS**, the Urban Water Management Planning Act requires that each water supplier update its plan at least once every five years on or before July 1, in years ending in six and one; and

**WHEREAS**, all water suppliers are required to complete and update an Urban Water Management Plan in order to be eligible for financial assistance administered by the Department of Water Resources; and

**WHEREAS**, the Florin Resource Conservation District (hereafter, "District") has prepared a thorough and complete update to the Urban Water Management Plan to serve the District as a long-range planning document for water supply; and

**WHEREAS**, the District's Urban Water Management Plan provides a source of information for Water Supply Assessments, Water Code Section 10613 et seq., and Written Verifications of Water Supply, Water Code Section 66473.7, where both statutes require detailed information regarding water availability to be provided to the City of Elk Grove or County of Sacramento decision makers prior to approval of specified large development projects; and

**WHEREAS**, the District has updated its 2025 Urban Water Management Plan in accordance with the Urban Water Management Planning Act.

**NOW, THEREFORE, THE FLORIN RESOURCE CONSERVATION DISTRICT BOARD OF DIRECTORS DOES HEREBY RESOLVE:**

SECTION 1. The Board of Directors hereby adopts the foregoing recitals as true and correct and incorporates them herein by reference.

SECTION 2. The Board of Directors hereby adopts the 2025 Urban Water Management Plan and orders it filed with the Board Secretary.

SECTION 3. The Board of Directors hereby authorizes and directs the District's General Manager to file the 2025 Urban Water Management Plan with the State of California, Department of Water Resources by July 1, 2026, in accordance with the Urban Water Management Planning Act.

SECTION 4. The Board of Directors hereby authorizes and directs the District's General Manager to implement the 2025 Urban Water Management Plan.

**PASSED, APPROVED AND ADOPTED** by the Florin Resource Conservation District Board of Directors on this 16th day of June 2026 by the following vote:

**AYES:** Lindsay, Green, Mulberg and Nelson

**NOES:**

**ABSENT:**

**ABSTAIN:**

Signed by:

*Paul Lindsay*

Paul Lindsay

Chair

ATTEST:

DocuSigned by:

*Stefani Phillips*

Stefani Phillips

Board Secretary

APPROVED AS TO FORM:

Signed by:

*Joshua M. Horowitz*

Joshua M. Horowitz

General Counsel

# APPENDIX B

## LOCAL HAZARD MITIGATION PLAN

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Annexes for:

- City of Elk Grove
- Sacramento County Water Agency

## Annex B City of Elk Grove

### B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Elk Grove, a previously participating jurisdiction to the 2016 Sacramento County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to Elk Grove, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

### B.2 Planning Process

As described above, Elk Grove followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-1. Additional details on Plan participation and City representatives are included in Appendix A.

*Table B-1 City of Elk Grove – Planning Team*

Name	Position/Title	How Participated
Rachael Brown	Economic Development Program Manager	Provided review and information on the economy section and the pandemic section.
Shane Diller	Assistant Director of Development Services	Provide review and input on building permits and municipal codes/policies and earthquake vulnerability and future development.
Sean Gallagher	Maintenance and Operations Manager	Provide review and input on assets at risk and mitigation efforts
Jamie Hudson	Real Time Information Center Supervisor	Provided review and input on emergency operations, vulnerability assessments, mitigations, extreme heat, wildfires, policies/procedures.
Christopher Jordan	Director of Strategic Planning and Innovation	Provided review and input on the General Plan, growth and development trends, and municipal codes/policies. Provided review and input on Climate Change and Drought.
Amittoj Thandi	Engineering Services Support Manager	Provided review and input on identifying hazards, vulnerability assessments, mitigations, critical facilities, development in a hazard area, flood, localized stormwater flooding, levees failures, heavy rains and storms, plans, municipal codes/policies. Attended meetings.

Name	Position/Title	How Participated
Carrie Whitlock	Strategic Planning and Innovation Program Manager	Facilitated LHMP update. Provided review and input on population trends, special populations, climate change, and pandemic sections.
Matt DeMarco Cosumnes Community Service District	Battalion Chief of Administration, CSD Fire	Provided review and input on the wildfire section.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table B-2.

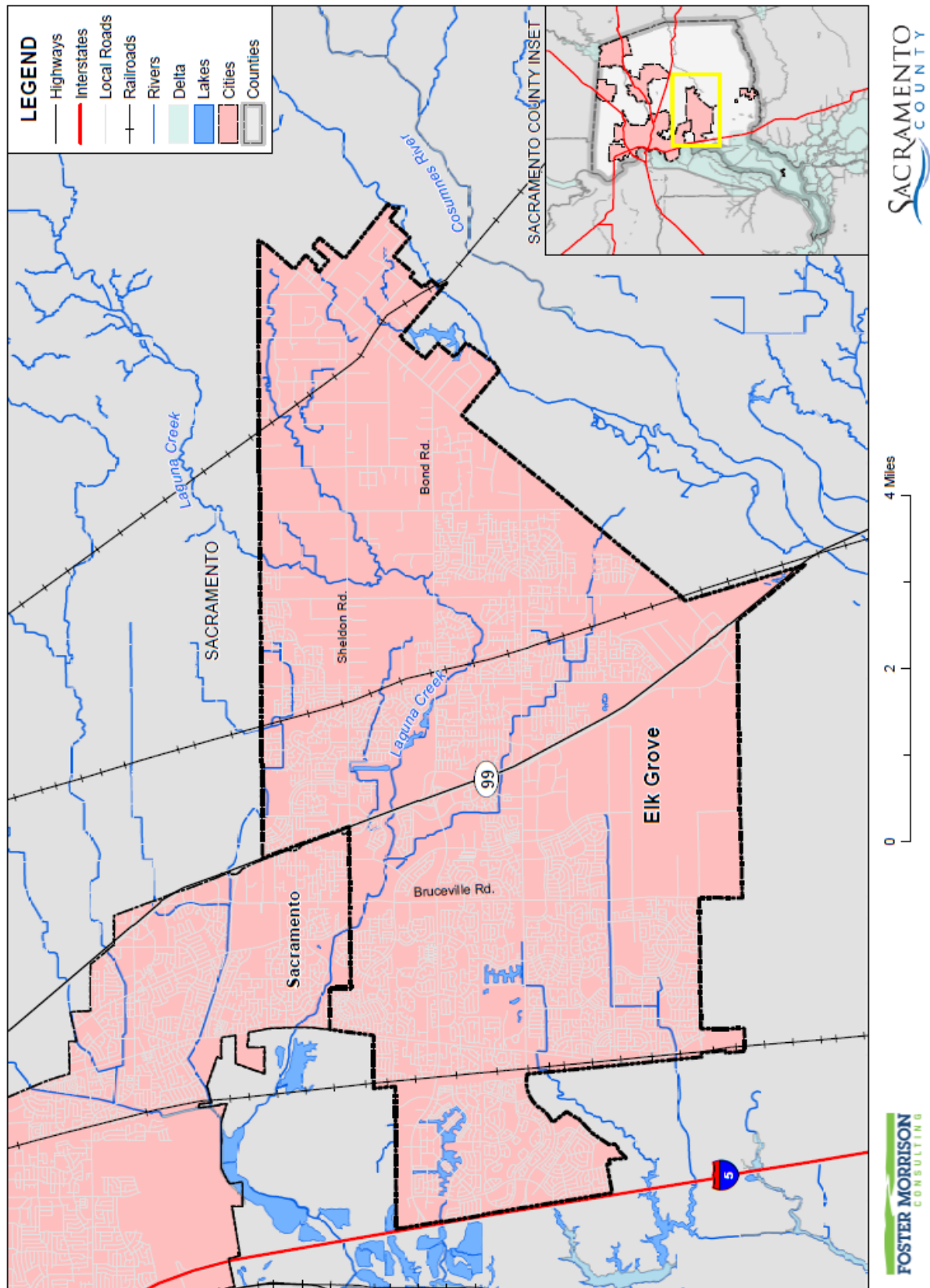
*Table B-2 2016 LHMP Incorporation*

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
General Plan	The General Plan was adopted in February 2019. The Safety Element was updated along with the General Plan update and incorporated as part of the document. A Vulnerability Assessment was also completed in October 2017 as part of the General Plan update.
Community Mobility Resilience Plan	The Community Mobility Resilience Plan was adopted in February 2021. The document outlines how the city will be impacted by several climate change related scenarios, including increased heat, increased precipitation and flooding, and fiscal concerns as a result of vehicle related changes, and proposes strategies to address these impacts. The flooding section, in particular, used the 2016 LHMP in the analysis of impacts.
Capital Improvement Program	Projects to mitigate flood risk and other hazards are programmed in the CIP annually. Constructed several projects during the previous 5-year period.
Emergency Operations Plan (EOP)	The Emergency Operations Plan was implemented in September 2018. It established an Emergency Management Organization and assigns functions and tasks consistent with the County of Sacramento, California’s Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS). It provides for the integration and coordination of planning efforts of multiple jurisdictions within the City of Elk Grove.
Storm Drainage Master Plan	The Storm Drainage Master Plan was adopted in 2011. A minor update was completed in 2019 to provide a summary of projects completed since 2011, provide details on remaining projects and information regarding new regulatory requirements.

## B.3 Community Profile

The community profile for the City of Elk Grove is detailed in the following sections. Figure B-1 displays a City map and the location of Elk Grove within Sacramento County.

Figure B-1 City of Elk Grove



### **B.3.1. Geography and Climate**

Elk Grove contains 42 square miles of land and sits at 46 ft. above mean sea level. The City is located within the Great Valley geomorphic province, which is primarily described as a relatively flat alluvial plain, about 50 miles wide and 400 miles long, with thick sequences of sedimentary deposits of Jurassic through Holocene age.

Shielded by the Sierra Nevada Mountains to the east, the California Coast ranges to the west, and the Siskiyou Mountains to the north, the City enjoys a mild climate for most of the year. In the summer, however, “northerns” blow from the Siskiyou Mountains, bearing pollens and heat. This is mitigated by the City’s extremely low humidity and the cool delta breezes. The winters are rainy. Rain generally falls only between November and March, with the rainy season tapering off almost completely by the end of April. Average yearly precipitation is 17" to 18", with almost no rain during the summer months, to an average rainfall of 3.7" in January. It rains, on average, 58 days of the year and there are 266 sunny days. In February of 1992, Sacramento had 16 consecutive days of rain (6.41"). A record 7.24" of rain fell on April 20, 1880. The average temperature throughout the year is 61°F, with the daily average ranging from 46°F in December and January to 76°F in July. Average daily high temperatures range from 53°F in December and January to 92°F in July (with many days of over 100°F highs). Daily low temperatures range from 38 to 58°F. The average year has 73 days with a high over 90°F, with the highest temperature on record being 114°F on July 17, 1925, and 18 days when the low drops below 32°F, with the coldest day on record being December 11, 1932, at 17°F.

On average, 96 days in the year have fog, mostly in the morning (tule fog), primarily in December and January. The fog can get extremely dense, lowering visibility to less than 100 feet and making driving conditions hazardous.

### **B.3.2. History**

A portion of the City lies within the former territory of six Plains Miwok tribelets along the Cosumnes River drainage and two, possibly three tribelets along the Sacramento River. James A. Bennyhoff’s research<sup>1</sup> revealed that the Plains Miwok were recognized as a distinct language group as early as 1806 when Spanish explorers first entered the region.

In 1850, the City was established as a hotel and a stop for the stage. The City is located about 15 miles south of historic Sutter’s Fort and thus became a crossroads for business, entertainment, mail service and agriculture, and acted as home base for gold miners in nearby communities. After it played its part in the early gold rush and statehood history in California, a close-knit community evolved with a distinctly rural and western lifestyle.

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<sup>1</sup> James A. Bennyhoff (1926-1993) was an anthropologist and professor at UC Berkeley, California.

Initially, the town developed around a stage stop on the Monterey Trail, though after the railroad passed by east of town, the City’s center shifted to its present location. “Old Town” Elk Grove is located about a mile east of State Route 99 (formerly U.S. Route 99, the north-south artery of the California Central Valley).

Despite the City’s close proximity to California’s capital city, Elk Grove remained quietly independent of Sacramento’s growth and development as it expanded into adjoining countywide areas until the 1980s. The City was incorporated as a general law city on July 1, 2000.

### **B.3.3. Economy and Tax Base**

Elk Grove is a rapidly growing City with one of the highest per capita incomes in the Sacramento region. In 2004 and 2005, the US Census Bureau named the City as the fastest growing city in the country. In 2008, the Gadberry Group recognized Elk Grove as one of eight most notable high-growth cities in the nation with the highest increase in average household income. US Census estimates show economic characteristics for the City of Elk Grove. These are shown in Table B-3 and Table B-4. Mean household income in the City was \$113,090. Median household income in the City was \$94,971.

*Table B-3 City of Elk Grove – Civilian Employed Population 16 years and Over*

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	686	0.8%
Construction	4,720	5.5%
Manufacturing	3,743	4.4%
Wholesale trade	2,109	2.5%
Retail trade	7,679	9.0%
Transportation and warehousing, and utilities	5,142	6.0%
Information	1,117	1.3%
Finance and insurance, and real estate and rental and leasing	6,087	7.1%
Professional, scientific, and management, and administrative and waste management services	8,068	9.5%
Educational services, and health care and social assistance	21,046	24.7%
Arts, entertainment, and recreation, and accommodation and food services	7,556	8.9%
Other services, except public administration	4,306	5.0%
Public administration	13,044	15.3%

Source: US Census Bureau American Community Survey 2019 Estimates

*Table B-4 City of Elk Grove – Income and Benefits*

Income Bracket	Percent
<\$10,000	3.4%
\$10,000 – \$14,999	2.5%
\$15,000 - \$24,9999	4.7%
\$25,000 – \$34,999	5.1%

Income Bracket	Percent
\$35,000 – \$49,999	8.3%
\$50,000 – \$74,999	14.2%
\$75,000 – \$99,999	13.7%
\$100,000 – \$149,999	22.0%
\$150,000 – \$199,999	12.7%
\$200,000 or more	13.5%

Source: US Census Bureau American Community Survey 2019 Estimates

Major employers in the vicinity are shown in Table B-5.

*Table B-5 Top Ten Employers in the Vicinity of Elk Grove*

Company	Est. Employees <sup>1</sup>
Apple, Inc. <sup>2</sup>	5,000
Elk Grove Unified School District	4,263
California Correctional Health Care Services <sup>3</sup>	1,731
Raley's	889
Wal-Mart Stores, Inc.	681
Kaiser Foundation Hospitals	524
Autozone, Inc. (including ALLDATA)	400
Elk Grove, City of <sup>3, 4</sup>	398
County of Sacramento	337
State of California	313

Source: EPS, Elk Grove Employment Dynamics

Notes:

1. Constitutes best estimate of current employment from available sources, based on Elk Grove Employment Dynamics Study completed by EPS in 2018.
2. While some employees at this location are contracted by other employment agencies, for purposes of this analysis, all employees at this location are considered Apple employees.
3. Based on 2018 estimates from the City of Elk Grove.
4. Includes permanent and contract staff.

### **B.3.4. Population**

The California Department of Finance estimated the January 1, 2020, total population for the City of Elk Grove was 176,154.

## **B.4 Hazard Identification**

Elk Grove identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Elk Grove (see Table B-6).

*Table B-6 City of Elk Grove—Hazard Identification Assessment*

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Limited	Unlikely	Limited	High	Medium
Drought & Water Shortage	Extensive	Likely	Limited	Medium	High
Earthquake	Significant	Occasional	Limited	Medium	Low
Earthquake Liquefaction	Limited	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance	Significant	Occasional/ Unlikely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flow	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Significant	Occasional	Critical	High	Medium
Pandemic	Extensive	Likely	Catastrophic	Medium	Medium
Severe Weather: Extreme Cold and Freeze	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Wind and Tornado	Limited	Occasional	Negligible	Low	Low
Subsidence	Limited	Unlikely	Negligible	Low	Medium
Volcano	Limited	Unlikely	Negligible	Low	Low
Wildfire	Significant	Highly Likely	Limited	High	High
<b>Geographic Extent</b> Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area		<b>Magnitude/Severity</b> Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid			
<b>Likelihood of Future Occurrences</b> Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		<b>Significance</b> Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact			
		<b>Climate Change Influence</b> Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact			

## B.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Elk Grove’s hazards and assess the City’s vulnerability separate from that of the Sacramento County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Sacramento County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City (as identified in the Significance column of Table B-6) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

### B.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section B.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Sacramento County Planning Area.

### B.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Elk Grove’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

#### *Values at Risk*

The following data from the Sacramento County Assessor’s Office is based on the 2020 Assessor’s data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table B-7 shows the 2020 Assessor’s values and content replacement values (e.g., the values at risk) broken down by property type for the City.

*Table B-7 City of Elk Grove – Total Values at Risk by Property Use*

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	19	7	\$1,376,347	\$1,239,312	\$1,239,312	\$3,854,971
Care/Health	36	27	\$37,940,058	\$152,964,107	\$152,964,107	\$343,868,272
Church/Welfare	51	47	\$32,627,506	\$131,084,326	\$131,084,326	\$294,796,158
Industrial	206	175	\$100,426,145	\$329,611,799	\$494,417,691	\$924,455,646
Miscellaneous	1,588	1	\$1,365,864	\$1,100	\$1,100	\$1,368,064
Office	326	296	\$101,150,230	\$531,234,209	\$531,234,209	\$1,163,618,648
Public/Utilities	72	0	\$110	\$0	\$0	\$110
Recreational	20	16	\$13,821,318	\$54,974,841	\$54,974,841	\$123,771,000
Residential	51,008	50,779	\$5,112,674,533	\$14,134,632,301	\$7,067,316,270	\$26,314,623,069
Retail/Commercial	433	400	\$389,355,339	\$1,006,778,621	\$1,006,778,621	\$2,402,912,581
Unknown	1	1	\$0	\$127,600	\$0	\$127,600
Vacant	1,824	60	\$471,773,843	\$12,326,932	\$0	\$484,100,775
<b>Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: Sacramento County 2020 Parcel/Assessor's Data

### *Critical Facilities and Infrastructure*

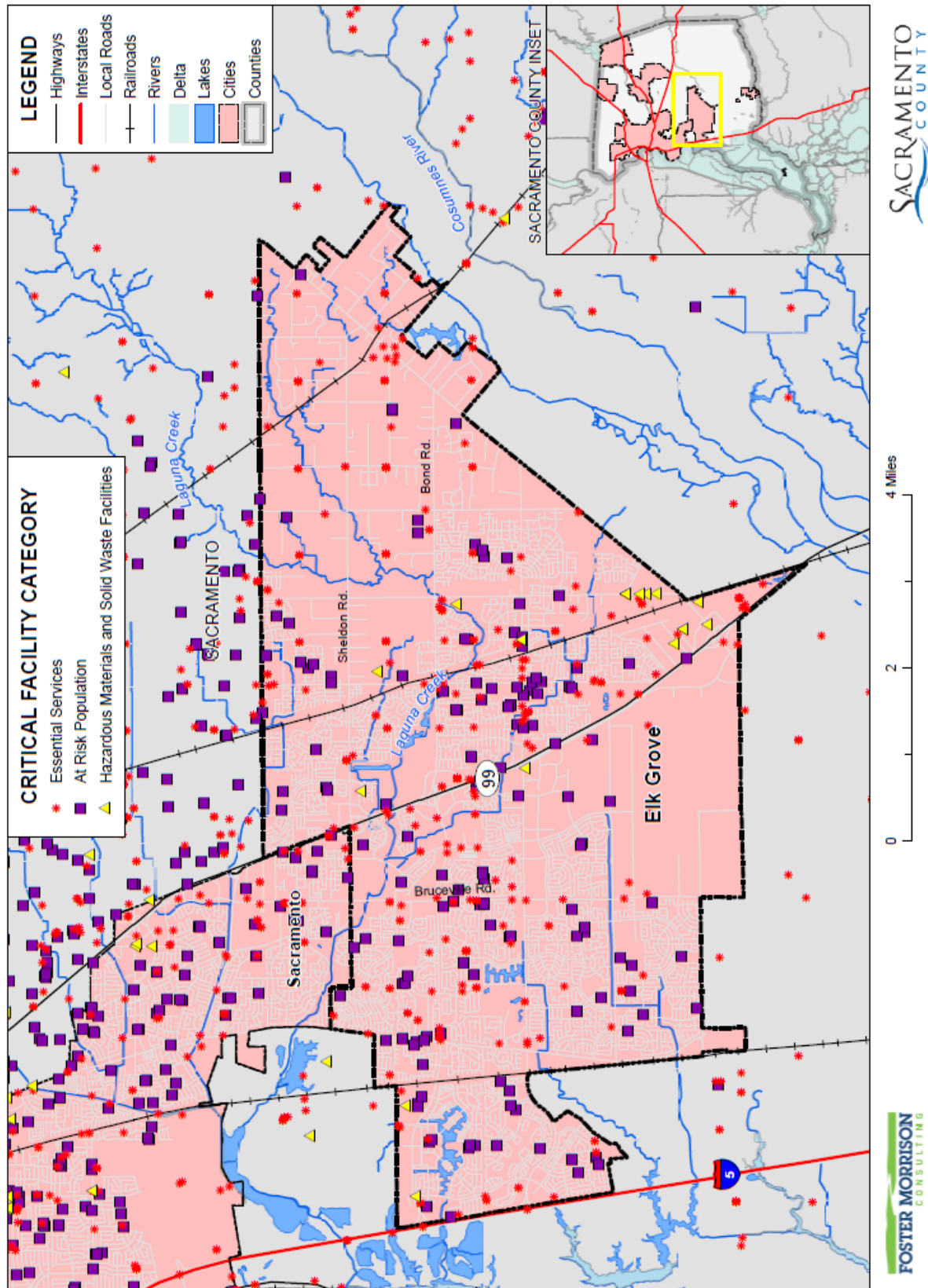
Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this Plan, a critical facility is defined as:

Put in the critical facility definition.

*Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, (3) Hazardous Materials and Solid Waste Facilities. Critical facilities in the City are shown on Figure B-2 and detailed in Table B-8.

Figure B-2 City of Elk Grove – Critical Facilities



Data Source: Sacramento County GIS, Cal-Atlas; Map Date: 08/2021.

*Table B-8 City of Elk Grove – Critical Facilities by Category and Type*

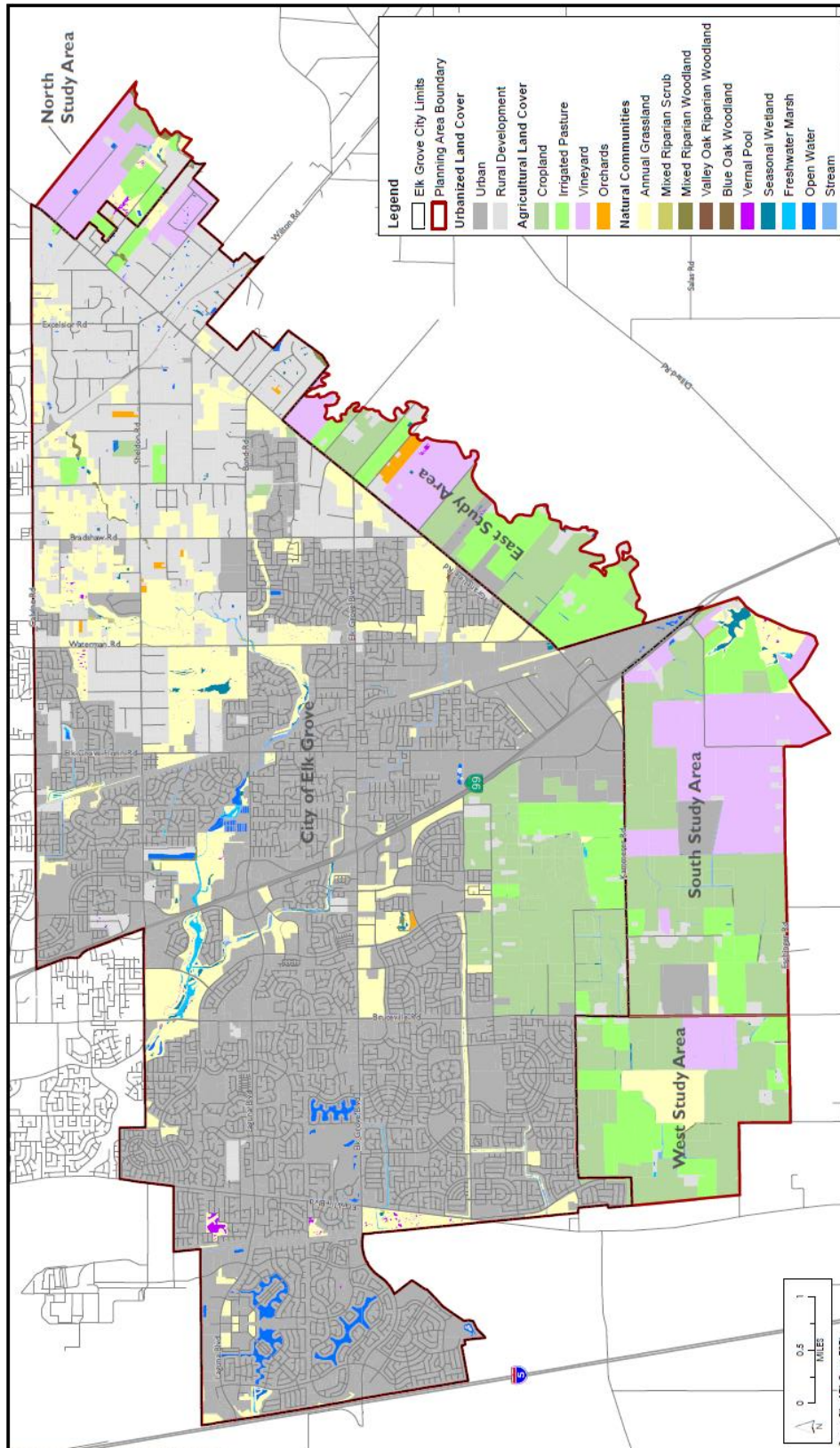
Critical Facility Category	Critical Facility Type	Facility Count
Essential Services Facilities	Cellular Tower	2
	Emergency Evacuation Center	8
	EMS Stations	7
	FDIC Insured Banks	26
	Fire Station	6
	Hospital or Urgent Care	1
	Law Enforcement	2
	Microwave Service Towers	107
	Sewage Treatment Plant	1
	Water Well	158
	<b>Total</b>	<b>318</b>
At Risk Population Facilities	Day Care Center	36
	Mobile Home Parks	1
	Places of Worship	89
	School	45
	<b>Total</b>	<b>171</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	6
	EPA ER TSCA Facility	3
	Leaky Underground Storage Tank	4
	Solid Waste Facility	4
	Waste Transfer Station	1
	<b>Total</b>	<b>18</b>
<b>Elk Grove Total</b>		<b>507</b>

Source: City of Elk Grove

### *Natural Resources*

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The City consists of a mix of urban, agricultural, and natural land cover types. Agricultural lands are divided into subcategories including cropland, irrigated pasture, vineyard, and orchard. Natural land covers include annual grasslands, mixed riparian scrub, mixed riparian woodland, valley oak riparian woodland, blue oak woodland, seasonal wetlands, vernal pools, freshwater marshes, open water, and streams. Land cover type and land uses in the City are shown in Figure B-3.

Figure B-3 City of Elk Grove – Vegetative Communities and Land Uses



Source: City of Elk Grove General Plan 2018 Environmental Impact Report

## Special Status Species

The following special-status species are known to occur within the natural habitats most likely to be present within the City boundaries. These and other species potentially occurring in the City can be found in Table B-9. Figure B-4 shows the locations of sensitive elements within the City.

*Table B-9 Special-Status Species Potentially Occurring in the City of Elk Grove*

Common Name	Scientific Name	Regulatory Status
Ahart's Dwarf Rush	<i>Juncus leiospermus var. abartii</i>	SC; --; 1 B
Boggs Lake Hedge- hyssop	<i>Gratiola heterosepala</i>	--; CE; 1 B
Delta Tule-pea	<i>Lathyrus jepsonii var. jepsonii</i>	SC; --; 1 B
Dwarf Downingia	<i>Downingia pusilla</i>	--; --; 2
Legenere	<i>Legenere limosa</i>	SC; --; 1 B
Mason's Lilaeopsis	<i>Lilaeopsis masonii</i>	SC; CR; 1 B
Northern California Black Walnut	<i>Juglans californica var. hindsii</i>	SC; --; 1 B
Pincushion navarettia	<i>Navaretia myersii spp. Myersii</i>	SC; --; 1 B
Rose Mallow	<i>Hibiscus lasiocarpus</i>	SC; --; 1 B
Sacramento Orcutt Grass	<i>Orcuttia viscida</i>	FE; CE; 1 B
Sacramento Orcutt Grass Critical Habitat	<i>Orcuttia viscida Critical Habitat</i>	--
San Joaquin Saltbrush	<i>Atriplex joaquiniana</i>	SC; --; 1 B
Sanford's Arrowhead	<i>Sagittaria sanfordii</i>	SC; --; 1 B
Slender Orcutt Grass	<i>Orcuttia tenuis</i>	FT; CE; 1 B
Slender Orcutt Grass Critical Habitat	<i>Orcuttia tenuis Critical Habitat</i>	--
California linderiella	<i>Linderiella occidentalis</i>	SC; --; --
Conservancy fairy shrimp	<i>Branchinecta conservation</i>	FE; --; --
Midvalley Fairy Shrimp	<i>Branchinecta mesovallensis</i>	SC; --; --
Valley Elderberry Longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT (PX); --; --
Vernal Pool Fairy Shrimp	<i>Branchinecta lynchi</i>	FT; --; --
Vernal Pool Tadpole Shrimp	<i>Lepidurus packardii</i>	FE; --; --
California Horned Lizard	<i>Phrynosoma coronatum frontale</i>	SC; CSC (protected full species); --
California Tiger Salamander	<i>Ambystoma californiense</i>	C; CSC (protected); --
Giant Garter Snake	<i>Thamnophis gigas</i>	FT; CT (protected); --
Northwestern Pond Turtle	<i>Clemmys marmorata marmorata</i>	SC; CSC; --
Silvery Legless Lizard	<i>Anniella pulchra pulchra</i>	SC; CSC; --
Western Spadefoot Toad	<i>Scaphiopus hammondi</i>	SC; CSC (protected); --

Common Name	Scientific Name	Regulatory Status
Central Valley Fall/Late Fall-run Chinook Salmon and Critical Habitat	<i>Oncorhynchus tshawytscha</i>	C; CSC; --
Central Valley Spring-run Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	FT; CT; --
Central Valley Winter – run Chinook Salmon and Critical Habitat	<i>Oncorhynchus tshawytscha</i>	FE; CE; --
Central Valley Steelhead	<i>Oncorhynchus mykiss</i>	FT; --; --
Delta Smelt	<i>Hypomesus transpacificus</i>	FT; CT; --
Green Sturgeon	<i>Acipenser medirostris</i>	SC; CSC; --
Pacific Lamprey	<i>Lam petra trident ata</i>	SC; --; --
River Lamprey	<i>Lam petra ayresi</i>	SC; CSC; --
Sacramento Splittail	<i>Pogonichthys macrolepidotus</i>	FT; CSC; --
Aleutian Canada Goose	<i>Branta Canadensis leucopareia</i>	FD; --; -- (Wintering)
American Bittern	<i>Botaurus lentiginosus</i>	SC; --; --
Bank Swallow	<i>Riparia riparia</i>	--; CT; -- (nesting)
Black Rail	<i>Laterallus jamaicensis coturniculus</i>	SC; CT (fully protected); --
Black Tern	<i>Chlidonias niger</i>	SC; CSC; -- (nesting colony)
Cooper’s Hawk	<i>Accipiter cooperi</i>	--; CSC; -- (nesting)
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	SC; --; -- (nesting)
Great Blue Heron	<i>Ardea herodias</i>	--; CDF (sensitive); -- (rookery)
Great Egret	<i>Ardea alba</i>	--; CDF (sensitive); -- (rookery)
Greater Sandhill Crane	<i>Grus canadensis tabida</i>	--; CT (fully protected); --
Lesser Sandhill Crane	<i>Grus canadensis canadensis</i>	--;CSC;--
Loggerhead Shrike	<i>Lanius ludovivianus</i>	SC; CSC; -- (nesting)
Mountain Plover	<i>Charadrius montanus</i>	FPT; CSC; -- (wintering)
Northern Harrier	<i>Circus cyaneus</i>	--;CSC;--
Nuttall’s Woodpecker	<i>Picoides nuttallii</i>	SLC; --; --
Oak Titmouse	<i>Baeolophus inornatus</i>	SLC; --; --
Snowy Egret	<i>Egretta thula</i>	SC; --; -- (rookery)
Song Sparrow (Modesto Population)	<i>Melospiza melodia</i>	--;CSC;--
Swainson’s Hawk	<i>Buteo swainsoni</i>	--; CT; --
Tricolored Blackbird	<i>Agelaius tricolor</i>	SC; CSC; -- (nesting colony)
Vaux’s Swift	<i>Chaetura vauxi</i>	--;CSC;--
Western Burrowing Owl	<i>Athene cunicularia hypugea</i>	SC; CSC; -- (burrowing sites)
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	SC; CE (fully protected); -- (nesting)
White-tailed Kite	<i>Elanus caeruleus</i>	SC; (fully protected); - - (nesting)

Common Name	Scientific Name	Regulatory Status
Yellow-breasted chat	<i>Icteria virens</i>	--;CSC;--
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	--;CSC;--
Yellow Warbler	<i>Setophaga petechia</i>	--;CSC;--
Fringed Myotis	<i>Myotis thysanodes</i>	SC; --; --
Greater Western Mastiff bat	<i>Eumops perotis californicus</i>	SC; CSC; --
Long-eared Myotis	<i>Myotis evotis</i>	SC; --; --
Long-legged Myotis	<i>Myotis volans</i>	SC; --; --
Pacific Western Big- eared bat	<i>Corynorhinus townsendii townsendii</i>	SC; CSC (full species); --
Pale Townsend's Big- eared bat	<i>Corynorhinus townsendii pallescens</i>	SC; CSC (full species); --
San Joaquin Pocket Mouse	<i>Perognathus inornatus</i>	SC; --; --
San Joaquin Woodrat	<i>Neotoma fuscipes riparia</i>	FE; CSC; --
Small-footed Myotis	<i>Myotis ciuolabrum</i>	SC; --; --
Yuma Myotis	<i>Myotis yumanensis</i>	SC; --; --

Source: Foothill Associates, 2002 and updated by Michael Baker International May 2016.

FE = federally endangered FT = federally threatened

SC = federal species of concern

C = candidate

CDF- California Department of Fish and Game (sensitive)

FPT = federal proposed threatened

FPE = federal proposed endangered

CE = State endangered

CT = State threatened

CR = State rare

CSC = California species of special concern

C = candidate for listing

1 B = CNPS (California Native Plant Society) list plants rare, threatened, or endangered in California or elsewhere

2 = CNPS list plants rare, threatened, or endangered in California, but more numerous elsewhere \* = not enough information available on this species

3 = CNPS list plants about which CNPS needs more information

4 = CNPS list plants of limited distribution – a watch list

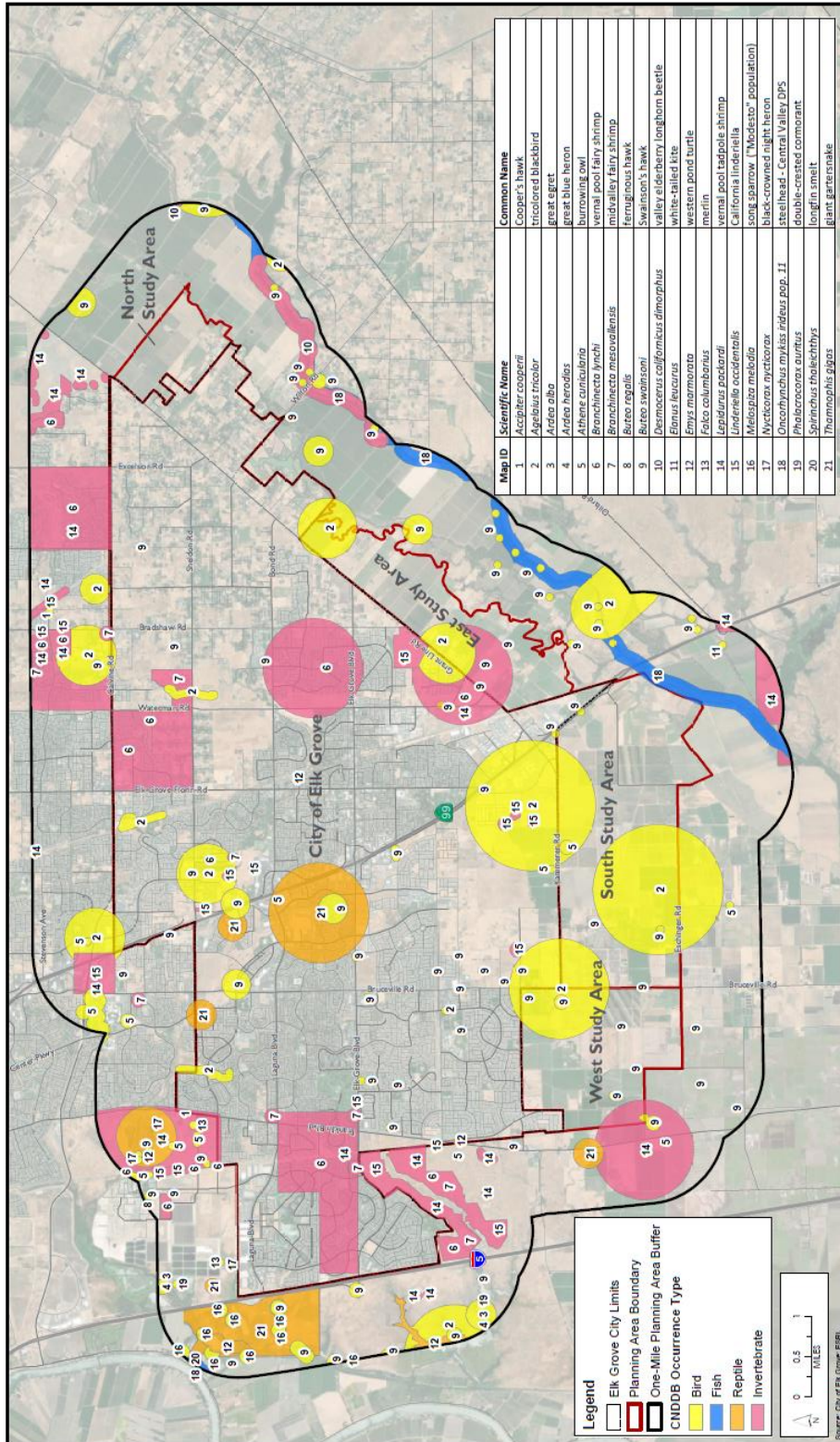
D = Delisted

MNBMC = Migratory Non-Game Bird of Management Concern

PX = Proposed Critical Habitat

SLC = Species of Local Concern

Figure B-4 City of Elk Grove Habitat Conditions and Known Occurrences of Special-Status Species



Source: City of Elk Grove General Plan Background Report 2018 Environmental Impact Report,

## Trees

Although native trees such as oaks (*Quercus sp.*) and California black walnuts (*Juglans californica var. jepsonii*) are not afforded special protection under State or federal law, loss of these species is of concern to the California Department of Fish and Wildlife and California Native Plant Society because of their continued depletion throughout California. In addition, the City regulates all projects with the potential to affect “Trees of Local Importance” as defined in Chapter 19.12 of the City’s Municipal Code, which is the City’s Tree Preservation and Protection Title. Trees of Local Importance include Coast live oak, Valley oak, Blue oak, Interior live oak, Oracle oak, California sycamore, and California black walnut with a diameter at breast height of six inches or greater; or multi-trunked trees with a combined diameter at breast height of six inches or greater.

In November 2005, the City Council formally adopted the Sacramento Tree Foundation’s regional Greenprint Program in order to achieve the sustainability and livability goals in the Sacramento region by expanding urban forests and optimizing the benefits of tree canopies. Since inception, the City has worked with the Sacramento Tree Foundation to plant over 2,000 trees throughout the City.

Each planting effort has been very successful in providing additional aesthetic and biological value to the community. The planting areas were strategically selected to benefit the public at large, while providing an environment for a high survival rate for the trees. All planting areas are located on City properties and Cosumnes Community Services District (CCSD) properties. Such planting areas include along creeks/channels, open spaces, parks, interchanges, and various streetscapes.

### *Historic and Cultural Resources*

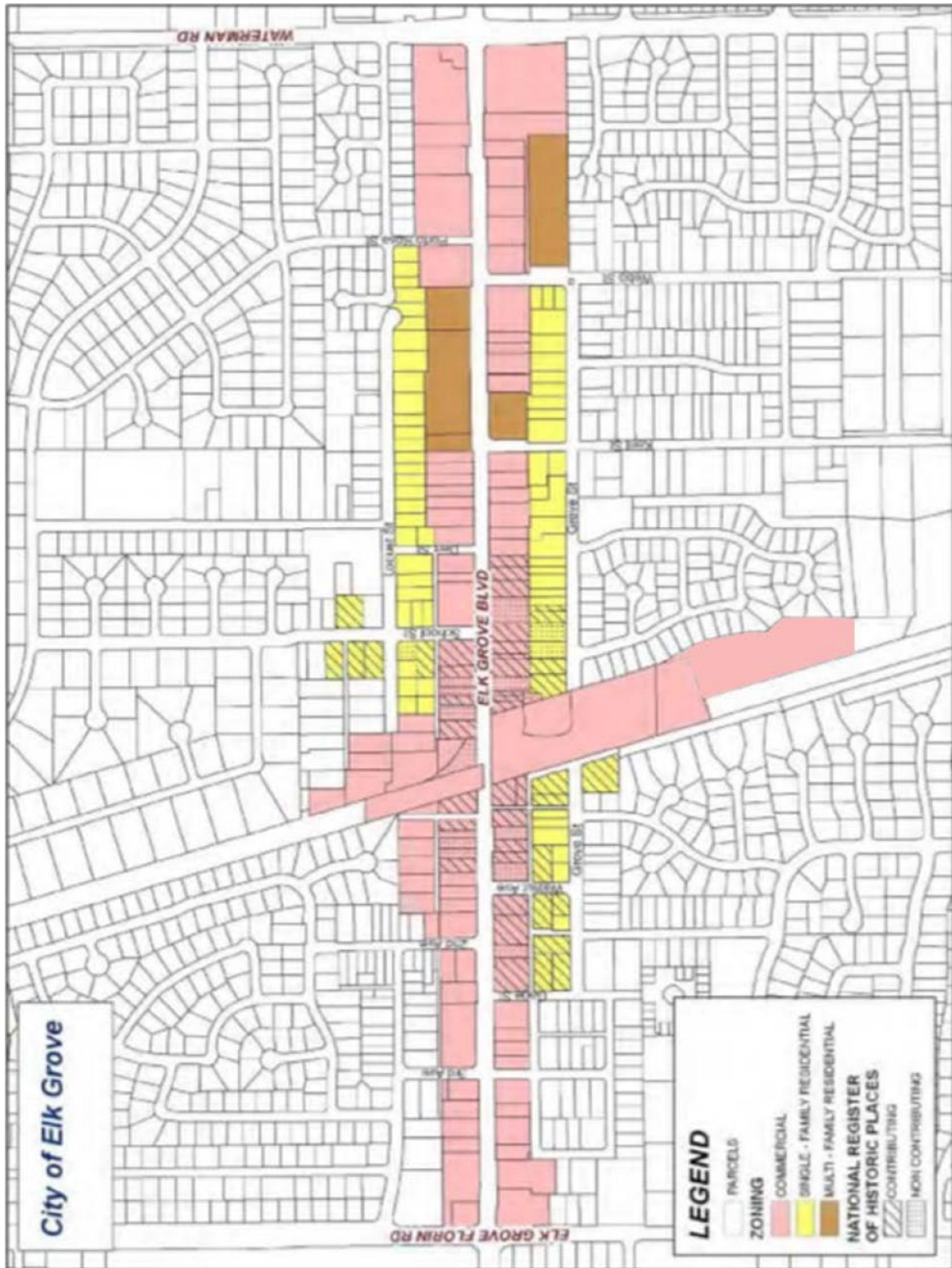
Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. Within the City’s vicinity there are ten commonly used place names representing historic communities, stations, schools or post offices, these include: Bruceville, Elk Grove, Franklin, Hood, McConnell Station, Pleasant Grove, Point Pleasant, Sheldon, Sloughhouse and Walsh. Portions of two Mexican land grants lie within the City: Leidesdorff’s Rancho Rio de los Americanos and Sheldon and Daylor’s Rancho Omochumnes.

The North Central Information Center’s records search identified 93 prehistoric and historic Native American archaeological sites within the area of Elk Grove. Many of these archaeological sites are village mounds; some of these could contain human remains.

Euro-American settlement of Elk Grove began in the mid-19th Century with a Mexican land grant of 11 square leagues of land in the Sacramento Valley to John Sutter, including the Rancho Del San Juan subgrant. This subgrant area occupied 20,000 acres, including the modern-day Elk Grove area. The area developed as an agricultural community consisting of families settling small farms surrounding the Sylvan Corners area, located at the present-day intersection of Sylvan Road, Auburn Boulevard, and Old Auburn Road. The 20th Century saw a boom in urbanization of the area, particularly after World War II, when subdivisions began springing up to accommodate an influx of new residents to the area. The area continued to grow, in part as the rocket manufacturing plant at Aerojet in nearby Rancho Cordova attracted employees and their families to the region. As this new development occurred, many older structures throughout the

community were demolished and replaced by tract housing and new commercial development to serve the booming population. As this shift occurred, Elk Grove saw its historical character change to a more urbanized, suburban community, losing its character as a rural agricultural community. Figure B-5 illustrates properties included in the Elk Grove Historic District, which is within the Old Town Elk Grove Special Planning Area.

Figure B-5 Elk Grove Old Town Historic Property District



Source: City of Elk Grove

The City of Elk Grove has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. Table B-10 lists the historical buildings in the City.

*Table B-10 City of Elk Grove – Historical Resources*

Name (Landmark Plaque Number)	National Register	State Landmark	California Register	Point of Interest	Date Listed	City/Area
Ehrhardt, William, House (N2209)	X				7/10/2003	Elk Grove
Elk Grove Grammar School / Elk Grove Unified School District (P717)				X	6/12/1989	Elk Grove
Elk Grove Historic District (N1553)	X				3/1/1988	Elk Grove
Grave of Elitha Cumi Donner Wilder (719)		X			12/2/1959	Elk Grove
Murphy's Ranch (680)		X			5/11/1959	Elk Grove
Site of First County Free Library Branch in California (817)		X			6/1/1967	Elk Grove

Source: California Department of Parks and Recreation Office of Historic Preservation, <http://ohp.parks.ca.gov/>

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

### *Growth and Development Trends*

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the City of Elk Grove General Plan 2013-2021 Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

### **Historic Population Trends and Current Population**

Population growth can increase the number of people living in hazard prone areas. Elk Grove has generally seen rapid growth. The City annexed the Laguna West area in 2003, which accounted for an instant population increase of approximately 13,400 persons. While population growth has slowed over the past

decade, it has still continued at an estimated 1.5% per year, with the population expected to top 200,000 within the next decade. Elk Grove has seen growth rates as shown in Table B-11.

*Table B-11 City of Elk Grove – Population Changes Since 1960*

Year	Population	Change	% Change
1960	2,205	–	–
1970	3,721	1,516	68.8%
1980	10,959	7,238	194.5%
1990	17,483	6,884	59.5%
2000	59,984	42,501	243.1%
2010 <sup>1</sup>	153,012	93,028	155.1%
2020 <sup>2</sup>	176,154	23,142	15.1%

Source: <sup>1</sup>US Census Bureau, <sup>2</sup>California Department of Finance

### Special Populations and Disadvantaged Communities

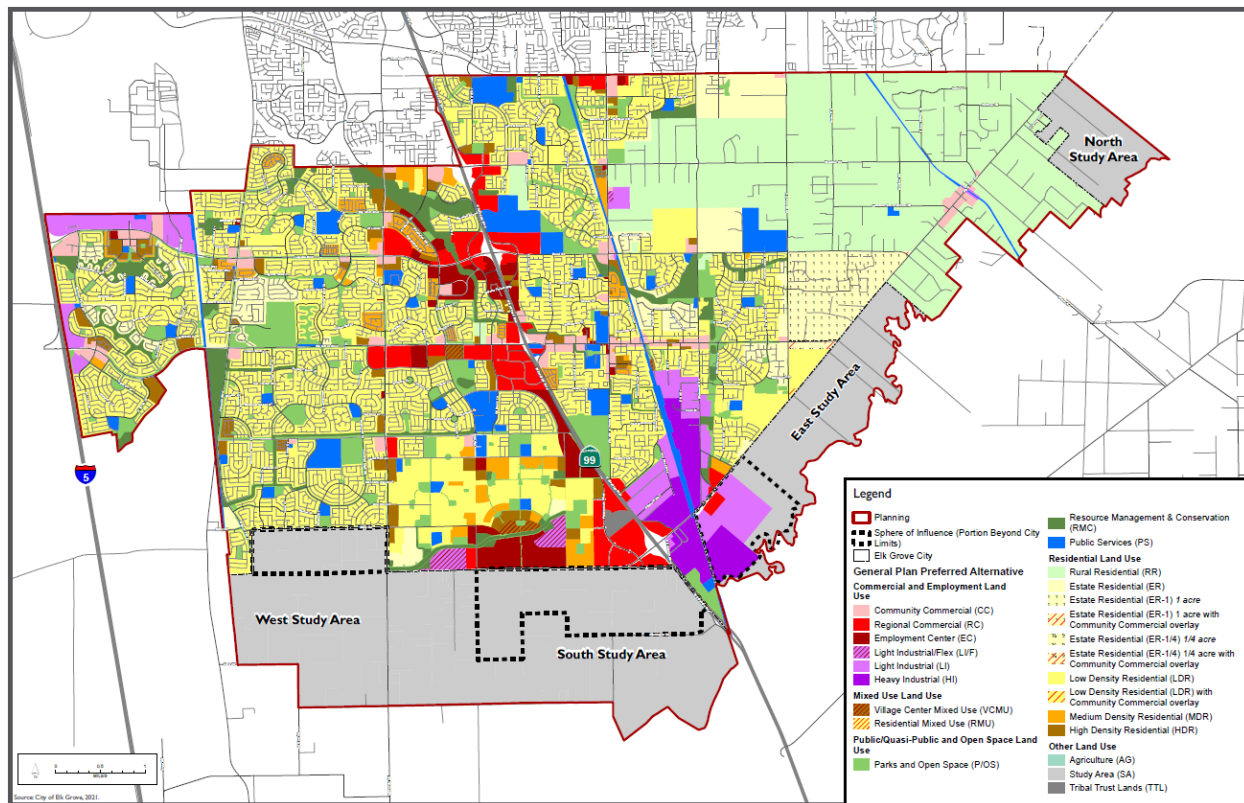
Disadvantaged communities as defined under Senate Bill 535 are not located within the City’ limits. There are locations within the City with higher percentages of individuals who would be particularly vulnerable during a hazard event. This includes those who are over 65 years, individuals and families living below the poverty level, disabled individuals, those with limited English skills and those without access to vehicles. The east side of Highway 99 has several locations with higher percentages of households living in poverty and a higher percentage of the population that is over 65 years.

### Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City’s land use designations are generally described below and mapped on the Land Use Diagram (Figure B-6). The Elk Grove Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Elk Grove. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. The Land Use Policy Map illustrates the planned land uses for lands within the City limits – see Figure B-6. The land use designations are used in assigning zoning categories and in the review of proposed projects.

Figure B-6 City of Elk Grove Land Use



Source: City of Elk Grove 2019 General Plan Land Use Element.

### Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the County since the last plan. Some of this has occurred in hazard prone areas. The City Building Department tracked total building permits issued since 2016 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table B-12 and Table B-13.

Table B-12 City of Elk Grove – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	0	0	0	0	0
Commercial	8	14	123	101	384
Industrial	1	1	3	3	0
Residential	455	410	609	697	404
Unknown	0	4	9	8	5
<b>Total</b>	<b>464</b>	<b>492</b>	<b>744</b>	<b>809</b>	<b>793</b>

Source: City of Elk Grove Building Department

*Table B-13 City of Elk Grove – Development in Hazard Areas since 2016*

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area <sup>1</sup>	Other
Agricultural	0	0	0	0
Commercial	0	42	0	0
Industrial	0	1	0	0
Residential	0	102	0	0
Unknown	0	1	0	0
<b>Total</b>	<b>0</b>	<b>146</b>	<b>0</b>	<b>0</b>

Source: City of Elk Grove Building Department

<sup>1</sup>Moderate or higher wildfire risk area

In Elk Grove, development occurred in the levee protected areas. While the data shows changes in development in the City since the 2016, including development in mapped hazard areas, all development is subject to current building standards to include any requirements for building in hazard areas which act to mitigate hazard exposure. Further development in hazard areas is only one factor of many that contribute to an overall change in hazard vulnerability. Based on these considerations, it cannot be definitively stated as to whether the development or even lack of development contributed to an increase or decrease in vulnerability for Elk Grove.

### Future Development

The Sacramento Council on Governments (SACOG) modeled population projections for the City of Elk Grove and other areas of the region in 2020 for a Metropolitan Transportation Plan/Sustainable Communities Strategy report. SACOG shows 65,660 housing units for 2035. With average people per household of 3.23 from the US Census Bureau Average Household size, SACOG estimates 2035 would be 212,082.

Table B-14, from the 2019 City of Elk Grove General Plan, identifies the development capacity associated with the planned distribution of land uses described in the Land Use Plan. As the density and intensity standards for each land use designation are implemented by future development projects and land use decisions, the activities occurring on properties will (consistent with the General Plan) transition from one activity to another, and land uses and intensities will shift to align with the intent of this Plan. The General Plan does not directly specify a maximum population for Elk Grove. The maximum possible number of residential units is determined by the different maximum densities allowed for each land use designation and the amount of land area within that designation. However, this maximum number of units is unlikely to be reached because every lot in Elk Grove would need to be developed to its maximum potential. Because much of the Planning Area is built out and existing buildings are generally in good condition, these changes will primarily occur on underutilized or vacant properties in the City and the Study Areas. Forecasting assumptions using reasonable inferences to determine the realistic expected development that could occur in Elk Grove after development or redevelopment of all properties that are expected to be developed, or redeveloped, are reflected in the development capacity.

*Table B-14 City of Elk Grove – General Plan Development Capacity*

	ACRES	DWELLING UNITS	POPULATION <sup>1</sup>	EMPLOYMENT (JOBS)	JOBS/HOUSING RATIO
EXISTING DEVELOPMENT TOTAL <sup>2</sup>	31,449	53,829	171,059	45,463	0.84
GENERAL PLAN TOTAL	34,956	102,865	332,254	122,155	1.21
CITY LIMITS SUBTOTAL	26,946	72,262	233,406	81,784	
STUDY AREAS SUBTOTAL	8,008	30,603	98,848	40,371	
<i>North Study Area</i>	<i>646</i>	<i>323</i>	<i>1,043</i>	<i>0</i>	
<i>East Study Area</i>	<i>1,772</i>	<i>4,806</i>	<i>15,523</i>	<i>3,875</i>	
<i>South Study Area</i>	<i>3,675</i>	<i>16,250</i>	<i>52,488</i>	<i>30,367</i>	
<i>West Study Area</i>	<i>1,915</i>	<i>9,224</i>	<i>29,794</i>	<i>6,129</i>	

Table Notes: Numbers may not sum due to rounding.

1. Based on 3.23 persons per household, average.
2. Existing development represents 2017 population and dwelling information and derived from 2013 jobs data (the most current year available at time of writing the General Plan).

Source: 2019 City of Elk Grove General Plan

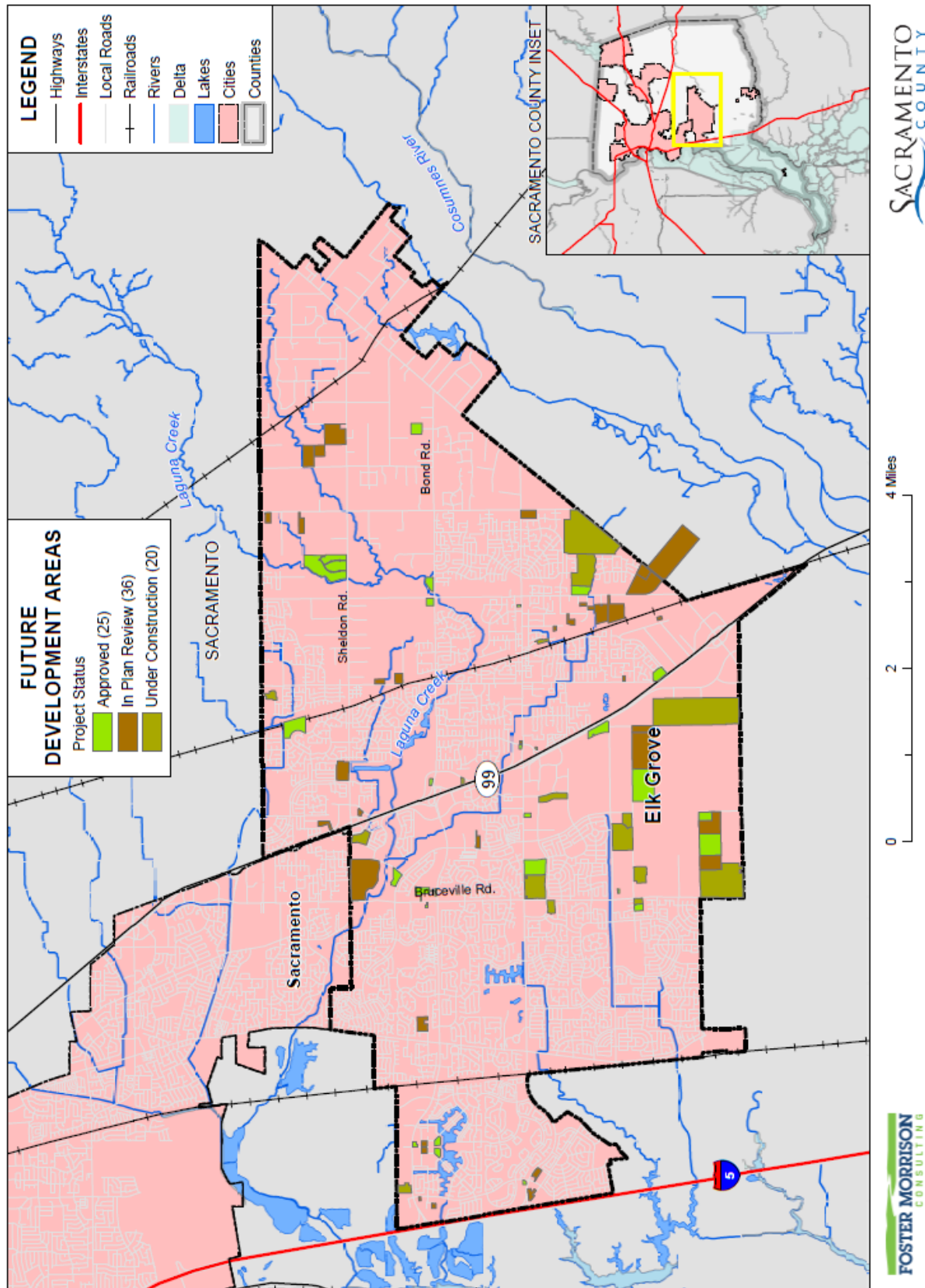
## GIS Analysis

The City of Elk Grove Development Services provided a list of projects that the City is seeing be developed. These were separated into three groups:

- Approved Projects (25 areas)
- In Plan Review (36 areas)
- Under Construction (20 areas)

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the City of Elk Grove. Future development areas in the City were provided in mapped format by the City. 3 categories of areas were provided. Using the GIS parcel spatial file for each of these areas, the 3 categories and 81 areas associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-7 shows the locations of future development areas the City is planning to develop. Table B-15 shows the summary of parcels and acreages of each future development area in the City, while Table B-16 breaks down the 3 categories into the 81 areas and shows the parcels and acres for each.

Figure B-7 City of Elk Grove – Future Development Areas



*Table B-15 City of Elk Grove – Summary of Future Development Area Parcels and Acres*

Future Development Status	Total Parcel Count	Improved Parcel Count	Total Acres
Approved	72	17	373.2
In Plan Review	54	21	675.5
Under Construction	2,064	888	713.5
<b>Grand Total</b>	<b>2,190</b>	<b>926</b>	<b>1,762.1</b>

Source: City of Elk Grove GIS

*Table B-16 City of Elk Grove – Detail of Future Development Area Parcels and Acres*

Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>Approved</b>			
AAA Services Building	1		0.7
Arco AM/PM Car Wash Expansion	1	1	1.2
Bond Road Rezone and Tentative Map	2	2	10.1
Buffalo Wild Wings	1		1.0
Creekside Estates	1		7.0
Crooked Creek Industrial Park	2	1	14.2
Dignity Health Medical Campus	7	1	28.0
Elk Grove Masonic Lodge	1		0.7
GreenSpace Self Storage Facility	1		3.0
Laguna West Plaza Pads 1 & 2	2		1.6
New Faze Skilled Nursing	1		15.1
Poppy Keys Southwest	3		60.2
Quail Run II	1		4.8
Raising Cane's Restaurant	1	1	1.7
Seasons at Stonebrook Master Home Plan	3		79.5
Sheldon Park Estates North Gated Community	28	9	71.9
Shell Gas Station	1		1.0
Shell with 7-Eleven & Storage Facility	4		4.5
Target Exterior Remodel	1	1	10.1
T-Mobile Evergreen Springs	1	1	2.3
T-Mobile Jones Family Park	1		26.7
Toscana Apartments	2		7.9
Trojan Storage II	1		8.9
U-Haul	4		10.2
Vineyard at Madeira Pad E	1		0.7
<b>Approved Total</b>	<b>72</b>	<b>17</b>	<b>373.2</b>

Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>In Plan Review</b>			
10069 Elk Grove Florin Road TPM	1	1	1.1
10075 Sheldon Road Tentative Parcel Map	1	1	35.3
8580 Bradshaw Road	1	0	8.3
8633 Bader Road Map	1	1	20.3
8651 Bader Road TPM and Rezone	1	1	10.0
9730 Kent Street Addition	1	0	1.3
Bartholomew Vineyard Amendment	1	1	10.3
Bow Stockton Apartments	2	1	5.6
Burger King Remodel	1	1	0.7
California Northstate University Medical Center	6	5	5.3
Candlewood Hotel	1	0	1.9
Eden Gardens Banquet Hall	1	1	5.2
Elk Grove Food Bank	1	1	2.0
Elk Grove Independent Senior Housing	2	0	5.2
Elk Grove Muslim Center	2	1	6.9
Grant Line Construction Aggregate Production and Recycling Facility	1	0	24.8
Hotel at Sheldon Place	1	0	2.3
In-N-Out Burger - The Ridge Pad 14	1	0	0.9
Kubota Tractor Corporation	1	1	101.6
Laguna Main Street Apartments	4	0	5.8
Laguna Springs Corporate Center - Building A	1	0	4.9
Life Storage Expansion	1	0	4.6
Mendes Villages 2 & 3	1	0	30.6
Mountain Elk Villas	1	0	12.1
Poppy Keys Southeast	4	0	66.5
S&J Storage	1	0	4.3
Sheldon Farms MHP	2	0	80.9
Sheldon Grove Subdivision	1	0	19.8
Tegan Estates	3	3	11.9
Telos Greens TSM and Rezone	1	0	26.4
Tractor Supply Company	1	0	67.4
Triangle Point TSM Phase 2	1	0	67.4
Warda Warehouse 3	1	0	1.5
Waterman Brinkman Logistics Center	3	1	21.6

Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
Wendy's Remodel	1	1	0.8
<b>In Plan Review Total</b>	<b>54</b>	<b>21</b>	<b>675.5</b>
<b>Under Construction</b>			
Bruceville Meadows Residential	253	0	96.5
Bruceville Point	2	1	8.3
Cafeteria Expansion	1	1	9.2
Calvine Pointe	1	0	7.1
Fieldstone North and South	514	234	113.6
Fortune School	2	0	40.0
Madeira South (Poppy Lane)	221	92	35.1
Madeira South Lot A Master House Plans	1	0	10.6
McGeary Ranch	84	3	13.3
Mendes Subdivision	1	0	39.5
Milestone	126	29	45.5
Railroad Street	4	1	3.2
Sheldon Farms North	1		43.8
Sheldon Terrace	204	74	14.3
Sterling Meadows	623	444	172.2
The Gardens at Quail Run	1	0	4.4
The Park Senior Housing	3	0	15.1
The Ridge Shopping Center	20	8	39.6
Towneplace Suites	1	1	1.7
Wienerschnitzel	1	0	0.4
<b>Under Construction Total</b>	<b>2,064</b>	<b>888</b>	<b>713.5</b>
<b>Grand Total</b>			
	<b>2,190</b>	<b>926</b>	<b>1,762.1</b>

Source: City of Elk Grove GIS

### B.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table B-6 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Sacramento County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow.

Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

## *Climate Change*

**Likelihood of Future Occurrence**—Likely

**Vulnerability**—Medium

## **Hazard Profile and Problem Description**

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

## **Location and Extent**

Climate change is a global phenomenon. It is expected to affect the whole of the City, Sacramento County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

## Past Occurrences

Climate change has never been directly linked to any declared disasters. Climate change is already beginning to affect the City’s annual average temperature and high temperatures. New record daily high temperatures were set for the weather station nearest to the City, at the Sacramento Executive Airport, for both August (112°F) and September (109°F) of 2020. Increases in extreme heat and in annual precipitation are expected to continue.

## Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Sacramento County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the City and Sacramento County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Sacramento County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

The 2019 Elk Grove Climate Action Plan (CAP) noted the following impacts to be expected from climate change:

- Increased Rate of Wildfires
  - ✓ Wildfire risk is based on a combination of factors including precipitation, winds, temperature, and vegetation. Wildfires are likely to grow in number and size throughout the State because of increased temperatures induced by climate change. Even under the “medium” warming scenario predicted by IPCC, wildfire risk will likely increase by 55 percent in California. Further, as wildfires increase in frequency and size, they will also increase in intensity.
  - ✓ Wildfire hazards in the mostly urbanized City are low, although they could occur with greater frequency in areas where development has expanded into previously rural areas. Grass fires could occur in portions of the South and East Study Areas that are currently undeveloped.
  - ✓ Although urbanized Elk Grove itself is unlikely to experience increased fire risk directly, wildfires in the Sierra Nevada and areas outside the county affect air quality in the Planning Area. Wildland

fires produce substantial emissions of particulate matter (i.e., smoke, soot), which may cause adverse health effects.

➤ Negative Impacts on Wildlife

- ✓ As temperatures rise, species are moving north in California or to higher elevations. This change in migration disrupts the food chain and prevents some plant species from being pollinated. Water and food supplies are expected to be more variable and to shift as the seasons change on different time frames.
- ✓ Further, those species that are unable to migrate face the danger of extinction: “The amount of future warming expected in California may likely exceed the tolerance of endemic species (i.e., those that are native to a specific location and that only occur there) given their limited distribution and microclimate.”
- ✓ With vegetation, reduction in soil moisture will result in early dieback of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Many of the potential effects on wildlife are still being studied, but due to an inability to adapt to new climates, the potential for severe species loss is present.
- ✓ Several potential hydrological changes associated with global climate change could also specifically influence the ecology of aquatic life in California and have negative effects on cold-water fish. For example, if a rise in air temperature by just a few degrees Celsius occurs, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp. Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults or juveniles or both.

➤ Heat and Deteriorating Public Health

- ✓ When extreme heat is experienced over a period of five or more days, they are known as heat waves. In the past (1950-2000) in Sacramento County, heat waves occurred at a rate of about one to two per decade. In the next 50 years, Elk Grove would be expected to experience approximately three heat waves per year.
- ✓ Heat waves are expected to have a major impact on public health, as well as decreasing air quality and increasing mosquito breeding and mosquito-borne diseases. Further, climate change is expected to alter the spread and prevalence of disease vectors, in addition to leading to a possible decrease in food quality and security. Vector control districts throughout the state are already evaluating how they will address the expected changes to the State’s climate.
- ✓ Taking cost-effective measures to reduce GHG emissions and protect public health is important for local governments. The new study provides evidence of what is becoming known as the “climate penalty,” where rising temperatures increase ground-level ozone and airborne health-damaging particles, despite the reductions achieved by programs targeting smog-forming emissions from cars, trucks, and industrial sources. Vulnerable populations, such as the elderly and the young, are more likely to be impacted by the effects of climate change, populations which also often lack sufficient resources to adapt to these effects. These vulnerable populations require assistance to respond to the short and long-term impacts of climate change. Additionally, social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks will need to be addressed proactively to reduce the potential for financial strain on local governments.

- A Decreasing Supply of Fresh Water
  - ✓ The State’s water supply is already under stress and is anticipated to shrink under even the most conservative climate change scenario. Warmer average global temperatures cause more rainfall than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snowpack melt in the spring. The Sierra snowpack is estimated to experience a 25 to 40 percent reduction from its historic average by 2050 and 48 to 65 percent by 2100. With rain and snow events becoming less predictable and more variable, the rate of flooding could increase and the State’s ability to store and transport fresh water for consumption could decrease. Further, warmer weather will lead to longer and hotter growing seasons and increase water demand for agricultural uses.
  - ✓ The City is supplied by a mix of surface water, groundwater, and recycled water. Much of this water ultimately originates as snowmelt from the Sierra Nevada and reaches Elk Grove through the State Water Project and the Central Valley Project. With these supplies declining, water shortages for all uses in the planning area may be affected.
  
- Increased Severity and Frequency of Flood Events
  - ✓ Climate change forecasts indicate more intense rainfall events, generating more frequent or extensive runoff, and flooding. Localized flood events may increase in periods of heavy rain due to increased precipitation rates. As explained by the Climate Adaptation Strategy, the State’s water system is structured and operated to balance between water storage for dry months and flood protection during rainy seasons. Although climate change is likely to lead to a drier climate overall, risks from regular, more intense rainfall events can generate more frequent and/or more severe flooding that upsets this managed balance between storage and protection. Several areas in the City have been determined by the Federal Emergency Management Agency (FEMA) and California Department of Water Resources (DWR) to fall within 500-, 200-, and 100-year floodplains. The City is within the larger Sacramento-San Joaquin Delta, and flooding in the Delta will be dependent on the resilience of the existing levee system, which is undergoing deterioration due to several stressors beyond land subsidence. Areas within the floodplains will likely be more vulnerable to the heightened flooding threats that are anticipated to result from climate change. Areas within the City that are at increased risk of flooding should remain a high priority for flood risk planning and efforts to address the local impacts of climate change.

## Future Development

The City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. As with the Sacramento region, extreme heat and flooding are the two main climate change related concerns for the area, in addition to smoke from wildfires. The Community Mobility Resilience Plan, adopted by the City in February 2021, includes strategies such as climate-smart green infrastructure and climate-smart building codes to mitigate these impacts.

### *Dam Failure*

**Likelihood of Future Occurrence**—Unlikely

**Vulnerability**—High

## Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

### Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.7 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DWR DSOD and Cal OES dam inundation areas are shown on Figure B-8 and Figure B-9. The City also falls in the Folsom Dam 235,000 cfs scenario, as discussed in Section 4.3.7 of the Base Plan as shown in Figure B-10. Geographical extents for these are shown in Table B-17. Based on available data, the City falls within the inundation areas of Calero and Folsom dams, as well as the Folsom Dam 235,000 cfs Scenario.

Note, the Cal OES and DSOD dam inundation data did not include inundation mapping of all dams that could affect the Sacramento County Planning Area and the City; thus, the below analysis reflects information based on available data. Other dams may be identified as a concern to the City. This includes Sly Park Dam (which stores water diverted from the North Fork Cosumnes River at Jenkinson Lake) which has the potential to cause flooding in the Planning Area, specifically in the northwestern and southeastern portions, in the event of dam failure.

Figure B-8 City of Elk Grove – Dam Inundation Areas for Dams Inside County

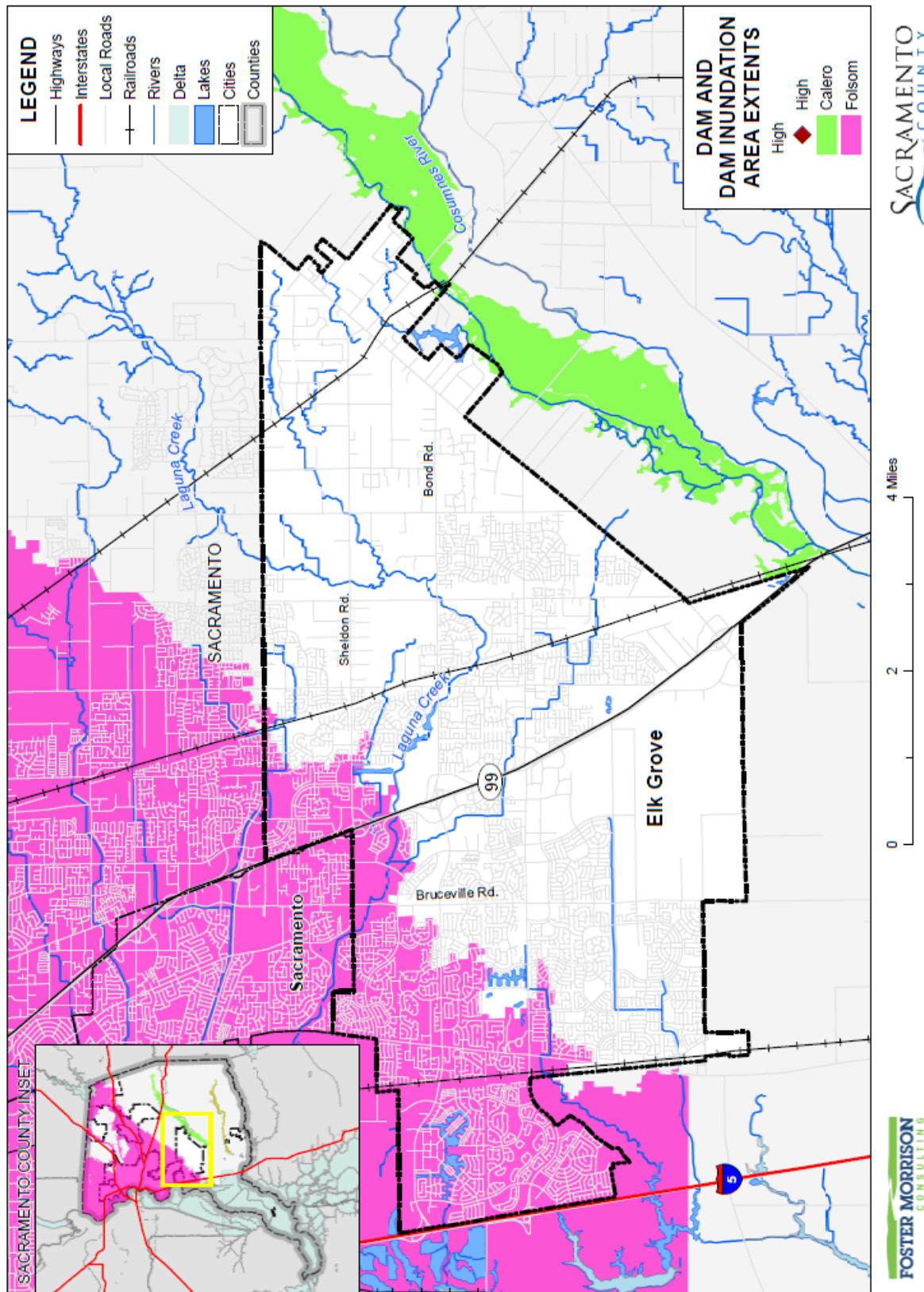
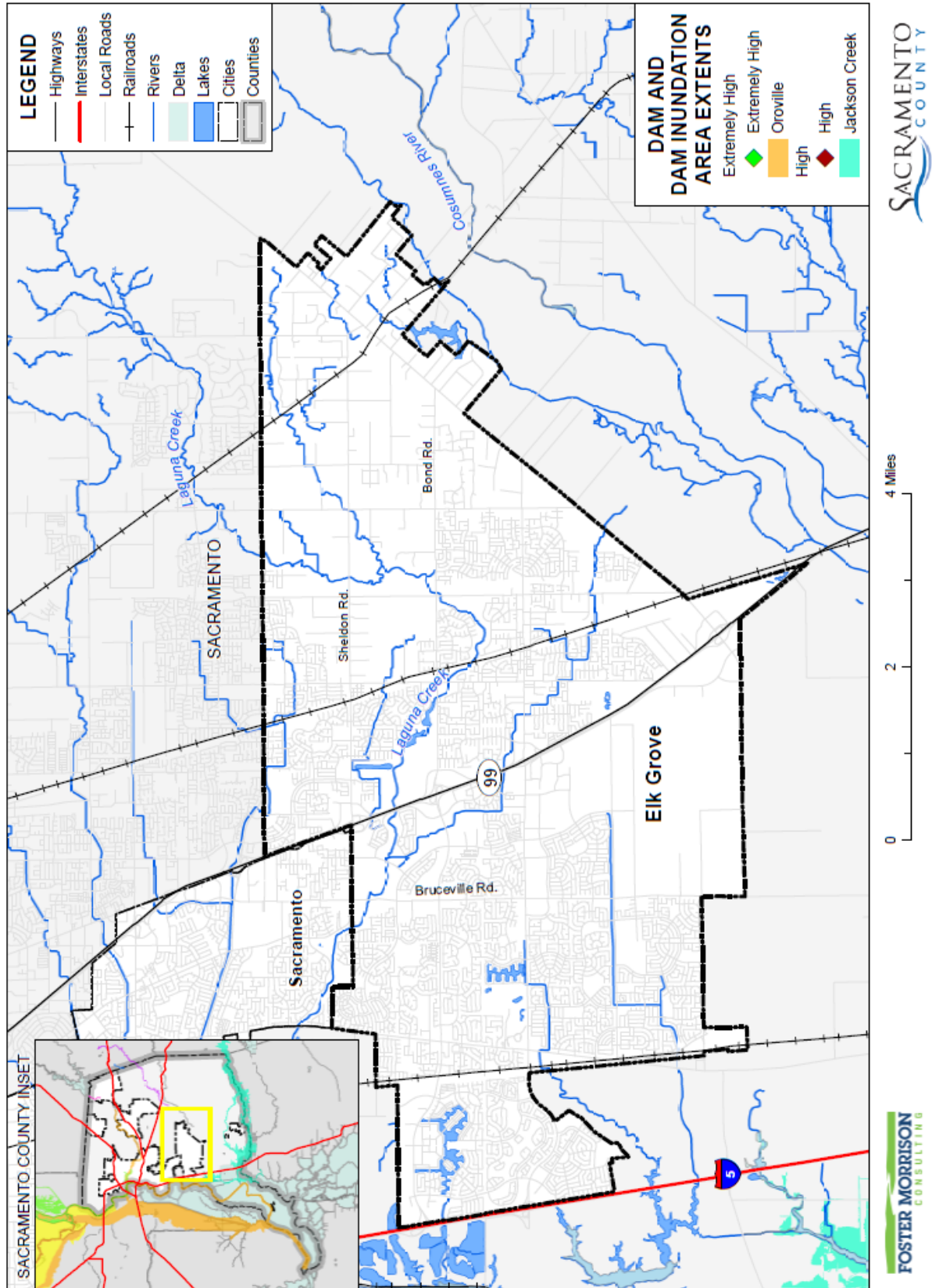
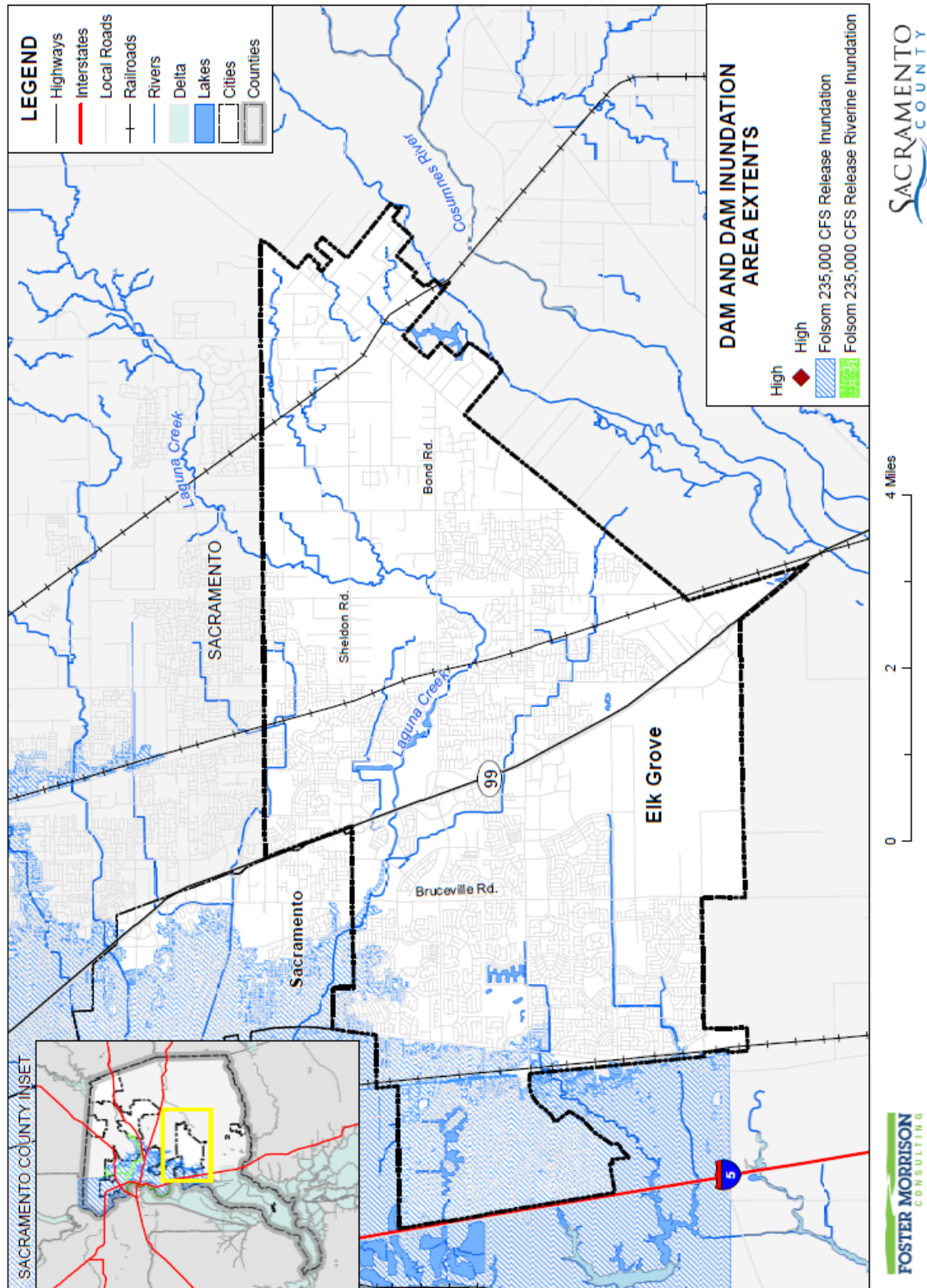


Figure B-9 City of Elk Grove – Dam Inundation Areas from Dams Outside County



Data Source: DWR DSOD Data 2020 and Cal OES Dam Status 10/2017, Sacramento County GIS, Cal-Atlas; Map Date: 9/2020.

Figure B-10 City of Elk Grove – Dam Inundation from Folsom Dam 235,000 cfs Scenario



*Table B-17 City of Elk Grove – Geographical Dam Inundation Extents*

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Calero	20.11	0.08%	18.89	0.10%	1.22	0.02%
Folsom	6,834.83	25.74%	5,297.04	27.89%	1,537.79	20.34%
Folsom 235,000 cfs Scenario	3,726.59	14.03%	2,923.81	15.39%	802.78	10.62%

Source: Cal OES, DSOD

### Past Occurrences

There has been no state or federal disaster declarations for dam failure in the County. The City noted no other dam failure occurrences that have affected the City.

### Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. The City of Elk Grove General Plan Environmental Impact Report noted that although they are not located in the City Planning Area, Folsom Dam (South Fork American River) and Sly Park Dam (which stores water diverted from the North Fork Cosumnes River at Jenkinson Lake) have the potential to cause flooding in the Planning Area, specifically in the northwestern and southeastern portions, in the event of dam failure.

Mass evacuation of the inundation area may be essential to save lives if warning time should permit. Extensive search and rescue operations may be required to assist trapped or injured persons. Emergency medical care, food, and temporary shelter would be required for injured or displaced persons. Identification and burial of many dead persons would pose difficult problems; public health would be a major concern. Many families would be separated, particularly if the failure should occur during working hours, and a personal inquiry or locator system would be essential. These and other emergency operations could be seriously hampered by the loss of communications, damage to transportation routes, and the disruption of public utilities and other essential services.

Governmental assistance could be required and may continue for an extended period. These efforts would be required to remove debris and clear roadways, demolish unsafe structures, assist in re-establishing public services and utilities, and provide continuing care and welfare for the affected population including, as required, temporary housing for displaced persons.

Impacts to the City from a dam failure flood also include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses could also be significant.

## Assets at Risk

Based on the vulnerability of Elk Grove to the dam failure hazard, the sections that follow describes significant assets at risk in the City of Elk Grove. This section includes the values at risk, inundated acres, population at risk, and critical facilities at risk.

### Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Elk Grove. The methodology described in Section 4.3.9 of the Base Plan was followed in determining structures and values at risk to dam failure. Table B-18 shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in dam inundation areas in the City.

*Table B-18 City of Elk Grove – Count and Values of Parcels at Risk by Dam Inundation Area and Property Use*

Dam Inundation Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
<b>Calero Dam – High Hazard Dam Inside the County</b>						
Public / Utilities	2	0	\$0	\$0	\$0	\$0
Residential	13	13	\$2,645,281	\$5,415,691	\$2,707,844	\$10,768,819
Vacant	1	0	\$224,176	\$0	\$0	\$224,176
<b>Elk Grove Total</b>	<b>16</b>	<b>13</b>	<b>\$2,869,457</b>	<b>\$5,415,691</b>	<b>\$2,707,844</b>	<b>\$10,992,995</b>
<b>Folsom Dam– High Hazard Dam Inside the County</b>						
Care / Health	9	8	\$12,434,157	\$82,370,114	\$82,370,114	\$177,174,385
Church / Welfare	13	12	\$8,567,571	\$43,063,886	\$43,063,886	\$94,695,343
Industrial	26	23	\$25,768,374	\$107,568,427	\$161,352,639	\$294,689,440
Miscellaneous	577	0	\$203,895	\$0	\$0	\$203,895
Office	86	76	\$20,753,116	\$113,186,570	\$113,186,570	\$247,126,256
Public / Utilities	20	0	\$20	\$0	\$0	\$20
Recreational	4	4	\$4,162,053	\$21,101,563	\$21,101,563	\$46,365,179
Residential	17,099	16,961	\$1,623,858,907	\$4,625,937,466	\$2,312,968,777	\$8,562,765,034
Retail / Commercial	90	85	\$67,973,067	\$178,671,359	\$178,671,359	\$425,315,785
Vacant	217	3	\$43,907,440	\$759,939	\$0	\$44,667,379
<b>Elk Grove Total</b>	<b>18,141</b>	<b>17,172</b>	<b>\$1,807,628,600</b>	<b>\$5,172,659,324</b>	<b>\$2,912,714,908</b>	<b>\$9,893,002,716</b>
<b>Folsom Dam 235,000 Scenario – High Hazard Dam Inside the County</b>						
Care / Health	4	4	\$2,144,377	\$5,510,457	\$5,510,457	\$13,165,291

Dam Inundation Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Church / Welfare	7	6	\$5,760,071	\$26,586,168	\$26,586,168	\$58,932,407
Industrial	17	14	\$21,689,632	\$92,610,251	\$138,915,376	\$253,215,258
Miscellaneous	343	0	\$34,244	\$0	\$0	\$34,244
Office	76	67	\$16,928,508	\$103,827,371	\$103,827,371	\$224,583,250
Public / Utilities	12	0	\$0	\$0	\$0	\$0
Recreational	4	4	\$4,162,053	\$21,101,563	\$21,101,563	\$46,365,179
Residential	9,224	9,125	\$955,938,275	\$2,799,519,623	\$1,399,759,850	\$5,155,217,662
Retail / Commercial	60	57	\$38,983,036	\$102,430,403	\$102,430,403	\$243,843,842
Vacant	67	0	\$30,695,841	\$0	\$0	\$30,695,841
<b>Elk Grove Total</b>	<b>9,814</b>	<b>9,277</b>	<b>\$1,076,336,037</b>	<b>\$3,151,585,836</b>	<b>\$1,798,131,188</b>	<b>\$6,026,052,974</b>

Source: CAL OES, DSOD, Sacramento County 2020 Parcel/Assessor's Data

### Population at Risk

The DSOD and Cal OES dam inundation areas were overlaid on the parcel layer. Those residential parcel centroids that intersect the dam inundation areas were counted and multiplied by the Census Bureau average household factors for Elk Grove – 3.20. This is shown in Table B-31.

*Table B-19 City of Elk Grove – Count of Improved Residential Parcels and Population by Dam Inundation Area*

Jurisdiction	Calero Dam Inundation Area		Folsom Dam Inundation Area		Folsom Dam 235,000 cfs Inundation Area	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Elk Grove	13	42	16,961	54,275	9,125	29,200

Source: Cal OES, DSOD, Sacramento County 2020 Parcel/Assessor's Data, US Census Bureau

### Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Elk Grove in identified dam inundation areas. GIS was used to determine whether the critical facility locations intersect a DSOD or Cal OES dam inundation area. Details of critical facilities in mapped dam inundation areas in the City of Elk Groves are shown in Figure B-11 and detailed in Table B-20. Details of critical facility definition, type, name and address and jurisdiction by dam inundation area are listed in Appendix F.

Figure B-11 City of Elk Grove – Critical Facilities in Dam Inundation Areas from Dams Inside County

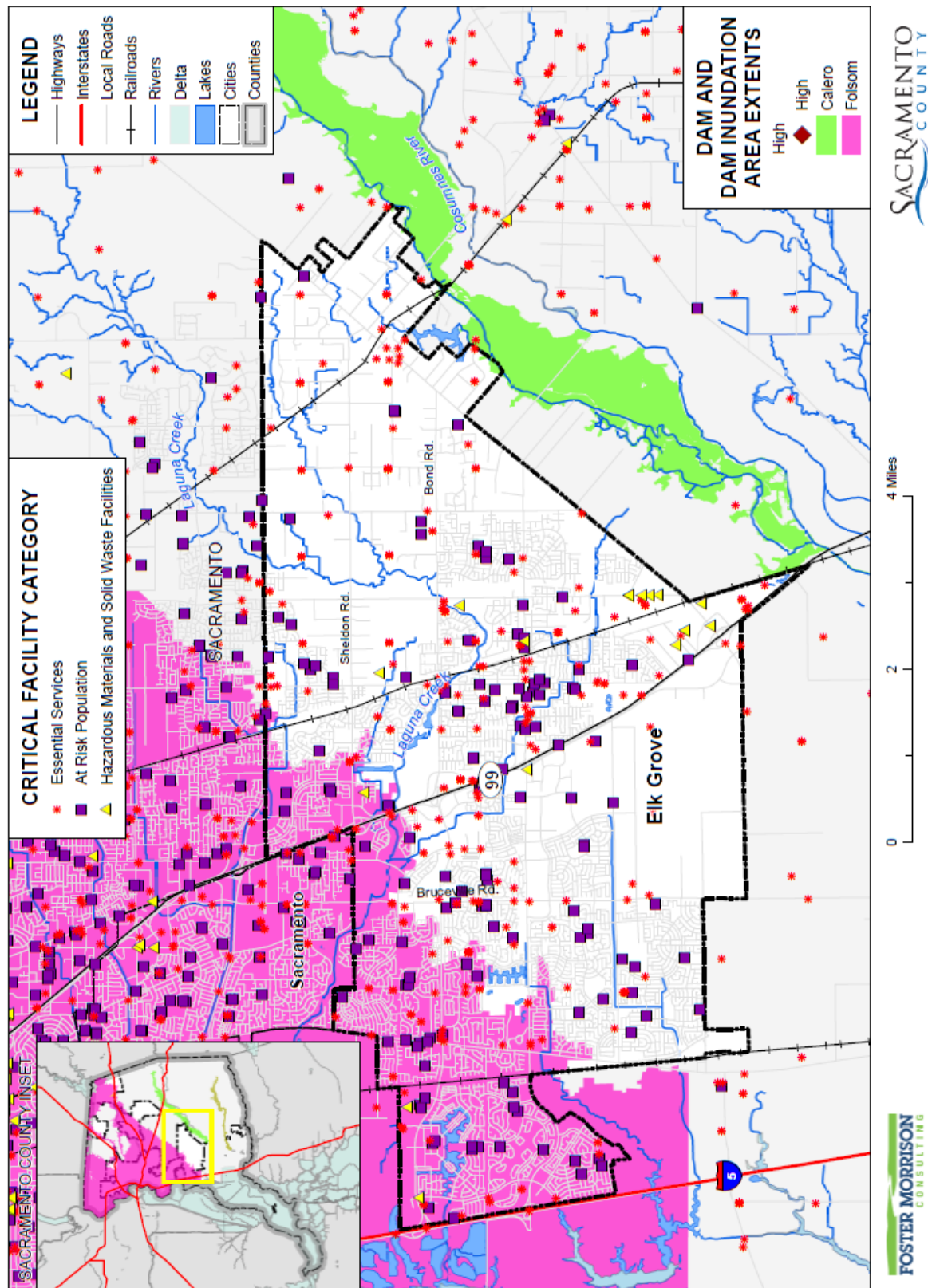
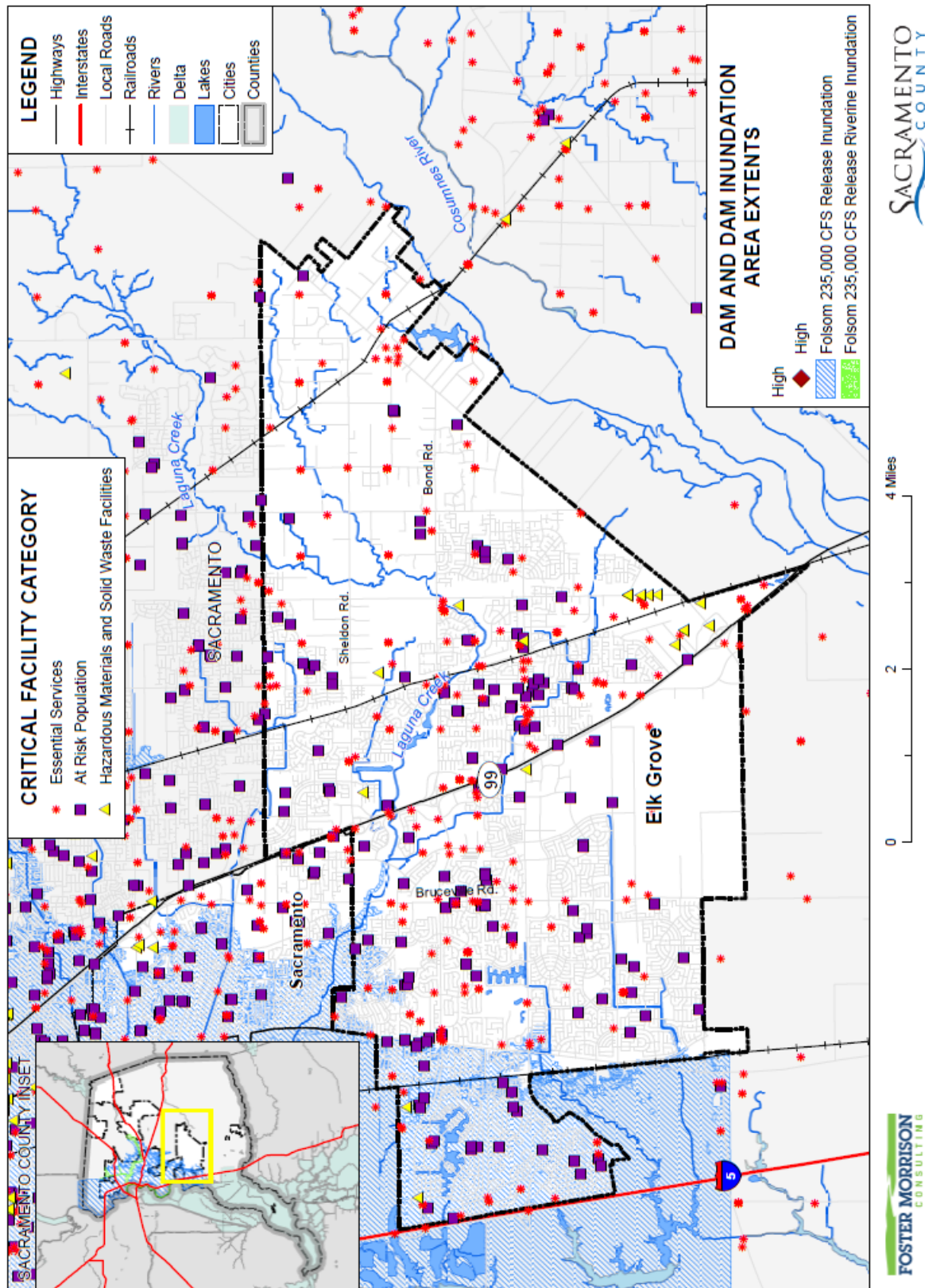


Figure B-12 City of Elk Grove – Critical Facilities in Folsom 235,000 cfs Scenario Dam Inundation Areas



Data Source: County-provided dam inundation data (CA\_DWR\_200YEAR\_FLOODPLAIN.zip 2020), DWR DSOD Data 2020, Sacramento County GIS, Cal-Atlas; Map Date: 08/2021.

*Table B-20 City of Elk Grove – Critical Facilities in Dam Inundation Areas by Category and Type*

Dam Inundation Areas/Critical Facility Category	Critical Facility Type	Facility Count
<b>Folsom Dam (High Hazard Dam Inside the County)</b>		
Essential Services Facilities	Emergency Evacuation Center	3
	EMS Stations	3
	FDIC Insured Banks	6
	Fire Station	2
	Microwave Service Towers	33
	Water Well	22
	<b>Total</b>	<b>69</b>
At Risk Population Facilities	Day Care Center	14
	Places of Worship	27
	School	11
	<b>Total</b>	<b>52</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	1
	Leaky Underground Storage Tank	1
	Solid Waste Facility	1
	<b>Total</b>	<b>3</b>
<b>Folsom Dam Total</b>		<b>124</b>
<b>Folsom Dam 235,000 cfs Scenario</b>		
Essential Services Facilities	Emergency Evacuation Center	2
	EMS Stations	1
	FDIC Insured Banks	2
	Fire Station	1
	Microwave Service Towers	14
	Water Well	8
	<b>Total</b>	<b>28</b>
At Risk Population Facilities	Day Care Center	6
	Places of Worship	15
	School	4
	<b>Total</b>	<b>25</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	1
	Leaky Underground Storage Tank	1
	<b>Total</b>	<b>2</b>
<b>Folsom Dam 235,000 cfs Total</b>		<b>124</b>

Source: Cal OES, DSOD, Sacramento County GIS

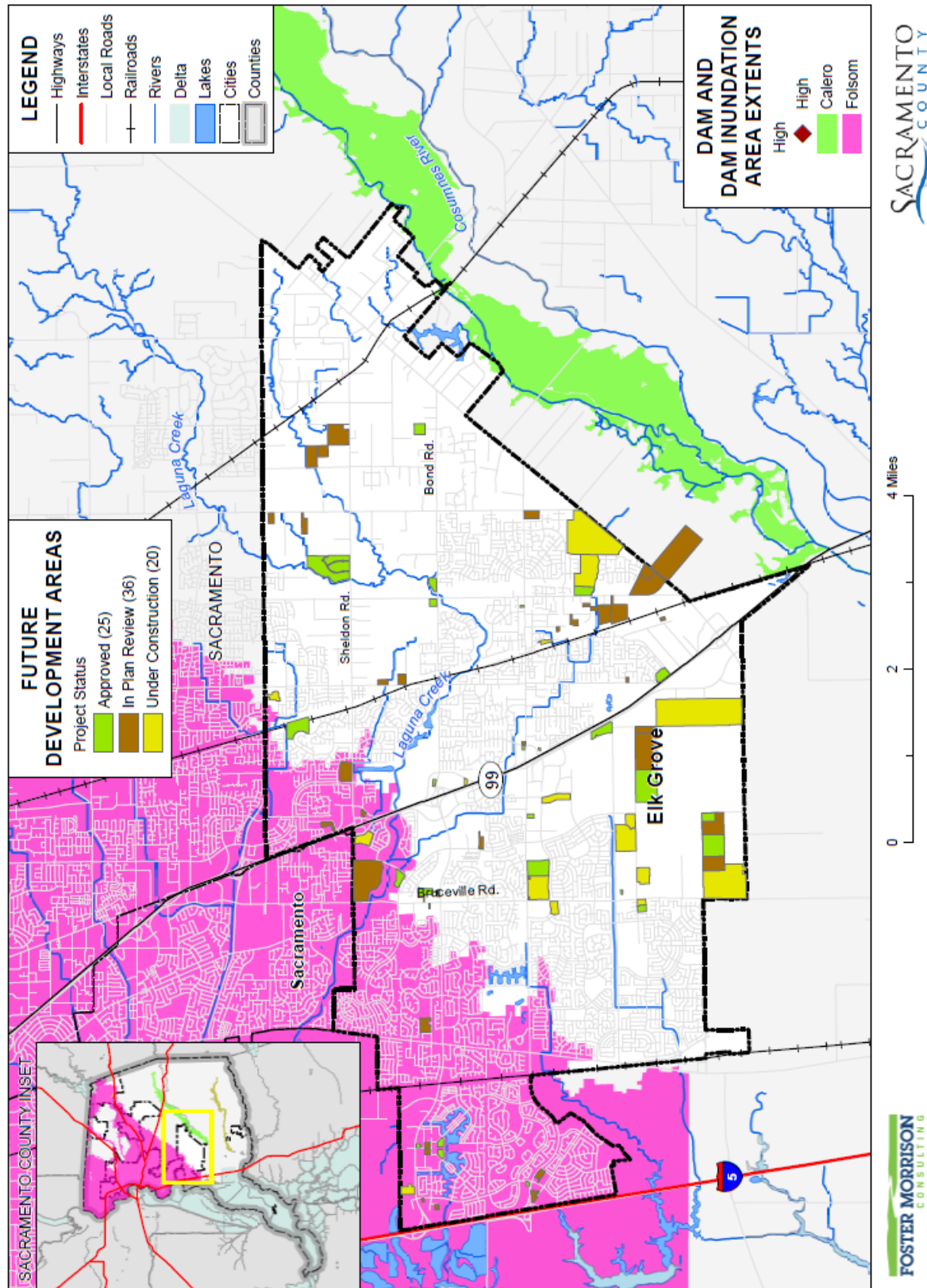
## Future Development

Future dam failures are considered unlikely. However, given the high number of affected parcels, future development in the City could be affected by dam failures and associated flooding. The City enforces its floodplain ordinance, which helps to reduce risk to flooding by requiring structures in the 1% annual chance floodplains to be above the base flood elevation, which depending on inundation depths and affected areas may provide some relief. Siting of future development areas will take dam failure flooding into account.

### *GIS Analysis*

The City provided future development areas were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-13 shows the locations of future development areas the City is planning to develop on the dam inundation zones from dams inside the County. Table B-21 shows the parcels and acreages of each future development area in the City in the dam inundation areas inside the County. Figure B-14 shows the locations of future development areas the City is planning to develop on Folsom Dam 235,000 cfs scenario inundation zones. Table B-22 shows the parcels and acreages of each future development area in the City in the Folsom 235,000 cfs release inundation area.

Figure B-13 City of Elk Grove – Dam Inundation Areas from Dams Inside the County and Future Development Areas



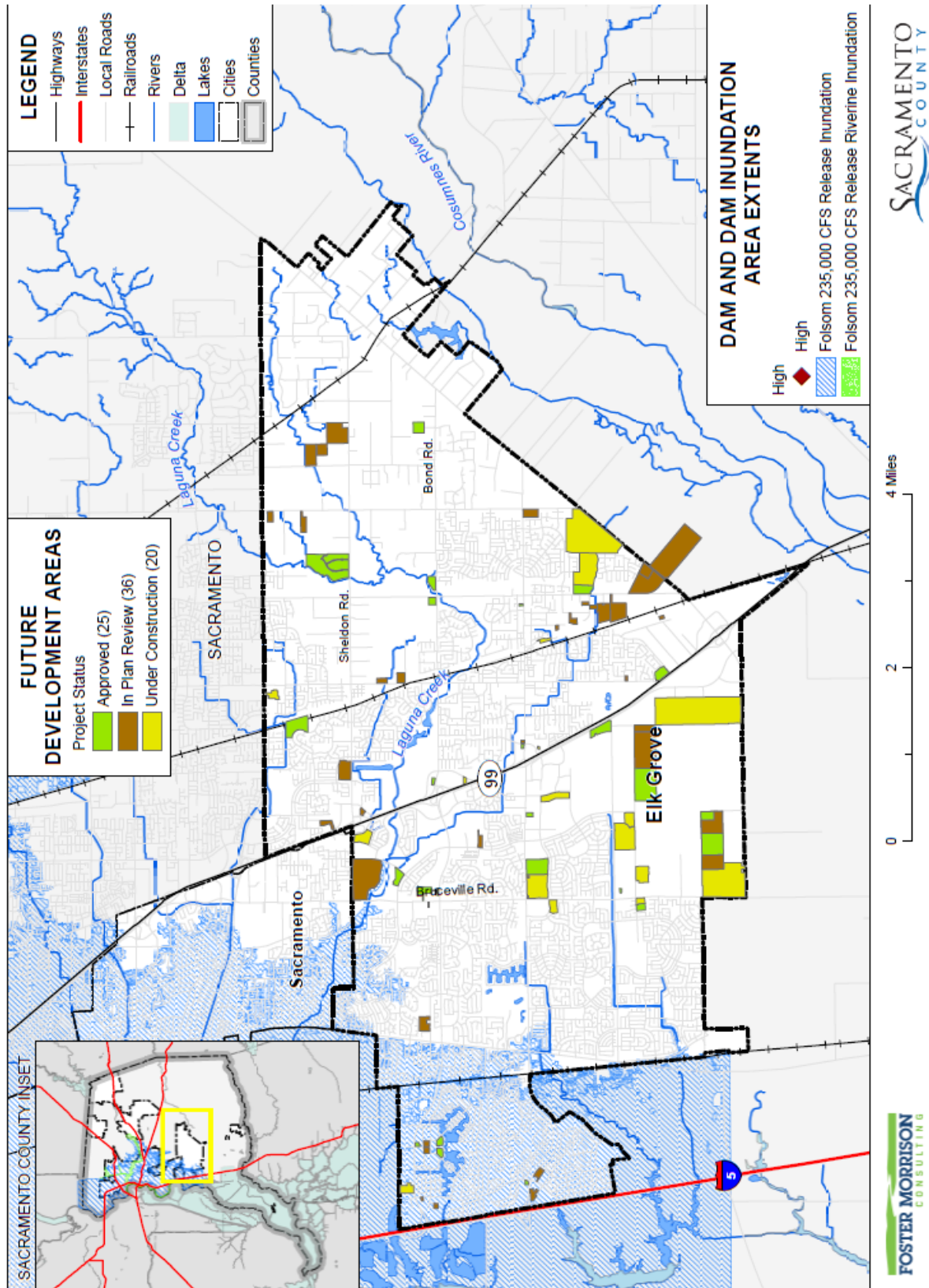
Data Source: County-provided dam inundation data (FOLSOM\_DAM\_INUNDATION\_AREA.shp 2016), DWR DSOD Data 2020 and Cal OES Dam Status 10/2017, Sacramento County GIS, Cal-Atlas; Map Date: 5/2021.

*Table B-21 City of Elk Grove – Dam Inundation Areas from Dams Inside the County and Future Development Areas*

Dam Inundation Areas / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>Folsom</b>			
<b>Approved</b>			
Arco AM/PM Car Wash Expansion	1	1	1.2
Laguna West Plaza Pads 1 & 2	2	0	1.6
Toscano Apartments	2	0	7.9
Trojan Storage II	1	0	8.9
<b>Approved Total</b>	<b>6</b>	<b>1</b>	<b>19.5</b>
<b>In Plan Review</b>			
Bow Stockton Apartments	2	1	5.6
California Northstate University Medical Center	6	5	5.3
Candlewood Hotel	1	0	1.9
Elk Grove Independent Senior Housing	2	0	5.2
Hotel at Sheldon Place	1	0	2.3
Laguna Main Street Apartments	4	0	5.8
Sheldon Farms MHP	2	0	80.9
Sheldon Grove Subdivision	1	0	19.8
Tegan Estates	3	3	11.9
Wendy's Remodel	1	1	0.8
<b>In Plan Review Total</b>	<b>23</b>	<b>10</b>	<b>139.3</b>
<b>Under Construction</b>			
Cafeteria Expansion	1	1	9.2
Sheldon Farms North	1	0	43.8
Sheldon Terrace	204	74	14.3
<b>Under Construction Total</b>	<b>206</b>	<b>75</b>	<b>67.3</b>
<b>Grand Total</b>	<b>235</b>	<b>86</b>	<b>226.1</b>

Source: City of Elk Grove GIS, Cal OES, DSOD

Figure B-14 City of Elk Grove – Folsom Dam 235,000 cfs Scenario and Future Development Areas



*Table B-22 City of Elk Grove – Dam Inundation Areas from Folsom Dam 235,000 cfs Release and Future Development Areas*

Dam Inundation Areas / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>Folsom 235,000 cfs Release</b>			
<b>Approved</b>			
Arco AM/PM Car Wash Expansion	1	1	1.2
Laguna West Plaza Pads 1 & 2	2	0	1.6
Toscano Apartments	2	0	7.9
<b>Approved Total</b>	<b>6</b>	<b>1</b>	<b>10.7</b>
<b>In Plan Review</b>			
California Northstate University Medical Center	6	5	5.3
Candlewood Hotel	1	0	1.9
Elk Grove Independent Senior Housing	2	0	5.2
Laguna Main Street Apartments	4	0	5.8
Wendy's Remodel	1	1	0.8
<b>In Plan Review Total</b>	<b>14</b>	<b>6</b>	<b>18.9</b>
<b>Under Construction</b>			
Cafeteria Expansion	1	1	9.2
<b>Under Construction Total</b>	<b>1</b>	<b>1</b>	<b>9.2</b>
<b>Grand Total</b>			
	<b>20</b>	<b>8</b>	<b>38.7</b>

Source: City of Elk Grove GIS, Cal OES, DSOD

***Drought & Water Shortage***

**Likelihood of Future Occurrence**–Likely  
**Vulnerability**–Medium

**Hazard Profile and Problem Description**

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

## Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the City, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City and the County are shown in Section 4.3.8 of the Base Plan.

## Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table B-23.

*Table B-23 Sacramento County – State and Federal Drought Disaster Declarations 1950-2020*

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	2008, 2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the City are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.3.8 of the Base Plan.

The City had moderate issues during the 2014-2016 drought. Quality of life was impacted due to severe cutbacks in irrigation, leaving many private landscape areas as browned out. The parks district limited watering to only certain facilities, leaving many neighborhood parks without irrigation. In addition, water was limited for construction-related use, such as fugitive dust mitigation.

## Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users.

Water for the City comes from the south American sub basin, as well as surface water from the Sacramento River. The Elk Grove Water District gets water from the aquifer and wholesale from the Sacramento County Water Agency (SCWA). SCWA gets its water from a number of sources, including a network of wells in Elk Grove and around the south county area, in addition to using surface water through conjunctive use.

Water resources are essential assets to communities and a shared economic responsibility of business and industry, farms and factories, individuals and communities. Water resource management is an urgent and growing need. Without water, neither small businesses nor major global industries can function. Nor can family farms, major agribusinesses, energy production facilities, computer manufacturers, or steel companies. Similarly, poor water quality, or limited or unreliable access to water means higher costs for all businesses – and all consumers. Water scarcity means greater risks for a community’s long-term viability and a negative impact on their competitiveness. It also means that a community’s ability to grow and create jobs is at risk.

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the City and Sacramento County Planning Area are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra’s, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

### **Future Development**

As the population in the area continues to grow, so will the demand for water. Water shortages in the future may be worsened by drought, as the City relies on surface water and groundwater for its water source. Increased planning including conjunctive use will be needed to account for population growth and increased water demands.

## *Earthquake*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—Medium

### **Hazard Profile and Problem Description**

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

### **Location and Extent**

Since earthquakes are regional events, the whole of the City is at risk to earthquake. Elk Grove and the surrounding area are at limited risk from significant seismic and geologic hazards. Geological literature indicates that no major active faults transect the County; however, there are several subsurface faults in the Delta. The Midland fault, buried under alluvium, extends north of Bethel Island in the Delta to the east of Lake Berryessa and is considered inactive but possibly capable of generating a near 7.0 (Richter Scale) earthquake. This magnitude figure is speculative based on an 1895 earthquake measuring 6.9 on the Richter Scale with an epicenter possibly in the Midland Fault vicinity. However, oil and gas companies exploring the area's energy potential have identified several subsurface faults, none of which show any recent surface rupture. A second, presumably inactive, fault is in the vicinity of Citrus Heights near Antelope Road. This fault's only exposure is along a railroad cut where offsetting geologic beds can be seen. Neither the lateral extent of the trace, the magnitude of the offset, nor the age of faulting has been determined. To the east, the Bear Mountain fault zone trends northwest-southeast through Amador and El Dorado Counties. Geologists believe this series of faults has not been active in historic time.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.9 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Sacramento County and the City fall within a low to moderate shake risk.

## Past Occurrences

The City noted no past occurrences of earthquakes or that affected the City in any meaningful way.

## Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Sacramento County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The City has a few URM buildings in the Old Town area, and no soft story buildings.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Elk Grove is within the less hazardous Zone 3.

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. Impacts from an earthquake in the City will vary depending on the fault that the earthquake occurs on, the distance to the epicenter, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life. A variety of industrial uses are located in the City of Elk Grove, primarily in the southern portion of Elk Grove and in the Laguna West area west of the City. Many of these industrial facilities use and/or store chemicals and other materials that could result in damage both on- and off-site in the event of seismic event.

## Earthquake Analysis

Due to the regional effects of an earthquake, a Hazus earthquake analysis was performed on a countywide basis. This can be found in Section 4.3.11 of the Base Plan. While these runs were not done specific to the City, maps showing damage in the County show greater areas of damage near the cities in the County.

## Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The City enforces the state building code, which mandates construction

techniques that minimize seismic hazards. Future development in the City is subject to these building codes.

### ***Flood: 1%/0.2% Annual Chance***

**Likelihood of Future Occurrence**—Occasional/Unlikely

**Vulnerability**—High

### **Hazard Profile and Problem Description**

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the City, and have caused damages in the past. Flooding is a significant problem in Sacramento County and the City of Elk Grove. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

As previously described in Section 4.3.11 of the Base Plan, the Sacramento County Planning Area and the City of Elk Grove have been subject to historical flooding. Elk Grove is traversed by several stream systems and is at risk to the 1% and 0.2% flood.

### **Location and Extent**

Location and extent of flooding for the City is discussed using three sources:

- FEMA 11/2/201/ DFIRM
- CA DWR 200-Year Flood Study
- Local Drainage and Flood Control

### ***FEMA DFIRM Extents***

The City of Elk Grove has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure B-15. According to the 2019 City of Elk Grove General Plan, the areas most susceptible to flooding are in the eastern portion of Elk Grove where major drainage facilities have not been built and stormwater flows either in natural channels or in small ditches where capacity is frequently exceeded. Another area susceptible to flooding is the Sheldon area, where local flooding is widespread but generally minor; the flat land causes floodwaters to spread out, reducing threats to life and property. Finally, along the eastern and southern edges of the City, the Cosumnes River (and Deer Creek tributary) represents a major flood hazard. The Cosumnes River is the last river in California that remains undammed along its entire length, so flooding caused by this river can be extensive. In the City, 1% annual chance flood zones include areas along Laguna Creek in the northwest and north-central portion of the City, and along the Cosumnes River to the southeast, primarily outside of City limits. Flood risk is intensified in the lower stream reaches by the likelihood of coincident high tides and strong offshore winds during heavy rainfall.

Figure B-15 City of Elk Grove – FEMA DFIRM Flood Zones

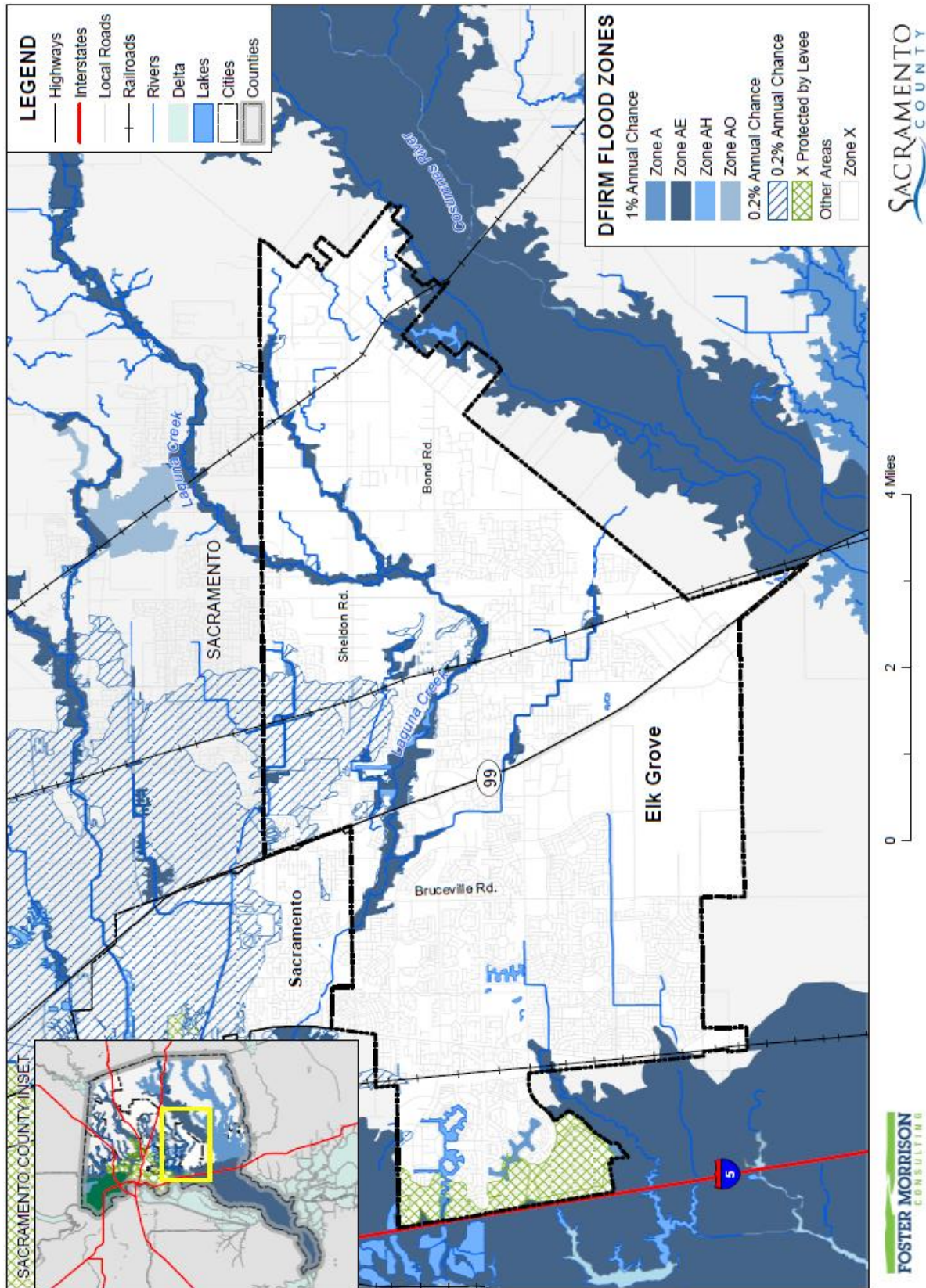


Table B-24 details the DFIRM mapped flood zones located within the City.

*Table B-24 City of Insert– DFIRM Flood Hazard Zones*

Flood Zone	Description	Flood Zone Present in City
A	1% annual chance flooding: No base flood elevations provided. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	1% annual chance flooding: Base flood elevations provided. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X*
AH	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.	
AO	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.	
A99	Areas subject to inundation by the 1-percent-annual-chance flood event, but which will ultimately be protected upon completion of an under-construction Federal flood protection system. These are areas of special flood hazard where enough progress has been made on the construction of a protection system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes. Zone A99 may only be used when the flood protection system has reached specified statutory progress toward completion. No Base Flood Elevations (BFEs) or depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood. Flood insurance is not mandatory but is available.	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone. Flood insurance is not mandatory but is available.	X
X (unshaded)	No flood hazard	X

Source: FEMA

\* Some of these parcels were actually removed from the SFHA by a Letter of Map Revision from FEMA (the FEMA maps still show the areas in the SFHA since the maps have not been updated).

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table B-25.

*Table B-25 City of Elk Grove – Geographical DFIRM Flood Zone Extents*

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	1,266	0.20%	477	0.13%	789	0.28%
0.2% Annual Chance	3,176	0.49%	2,607	0.72%	569	0.20%
Other Areas	22,114	3.43%	15,912	4.41%	6,202	2.19%
<b>Total</b>	<b>26,556</b>	<b>4.12%</b>	<b>18,996</b>	<b>5.26%</b>	<b>7,560</b>	<b>2.67%</b>

Source: FEMA DFIRM 11/2/2018

### *CA DWR 200-Year Flood Study*

The limits of the 200-year floodplain for the City of Elk Grove are shown in Figure B-16. This map identifies areas where higher standards of development and flood protection may be required prior to the issuance of building permits. Figure B-16 was developed using data provided by DWR, supplemented by floodplain studies commissioned by the City, covering local creek systems that have watershed areas of at least 10 square miles. These areas include the Laguna Creek and Deer Creek/Cosumnes River watersheds, as well as the Sacramento River watershed, which affects local creek systems.

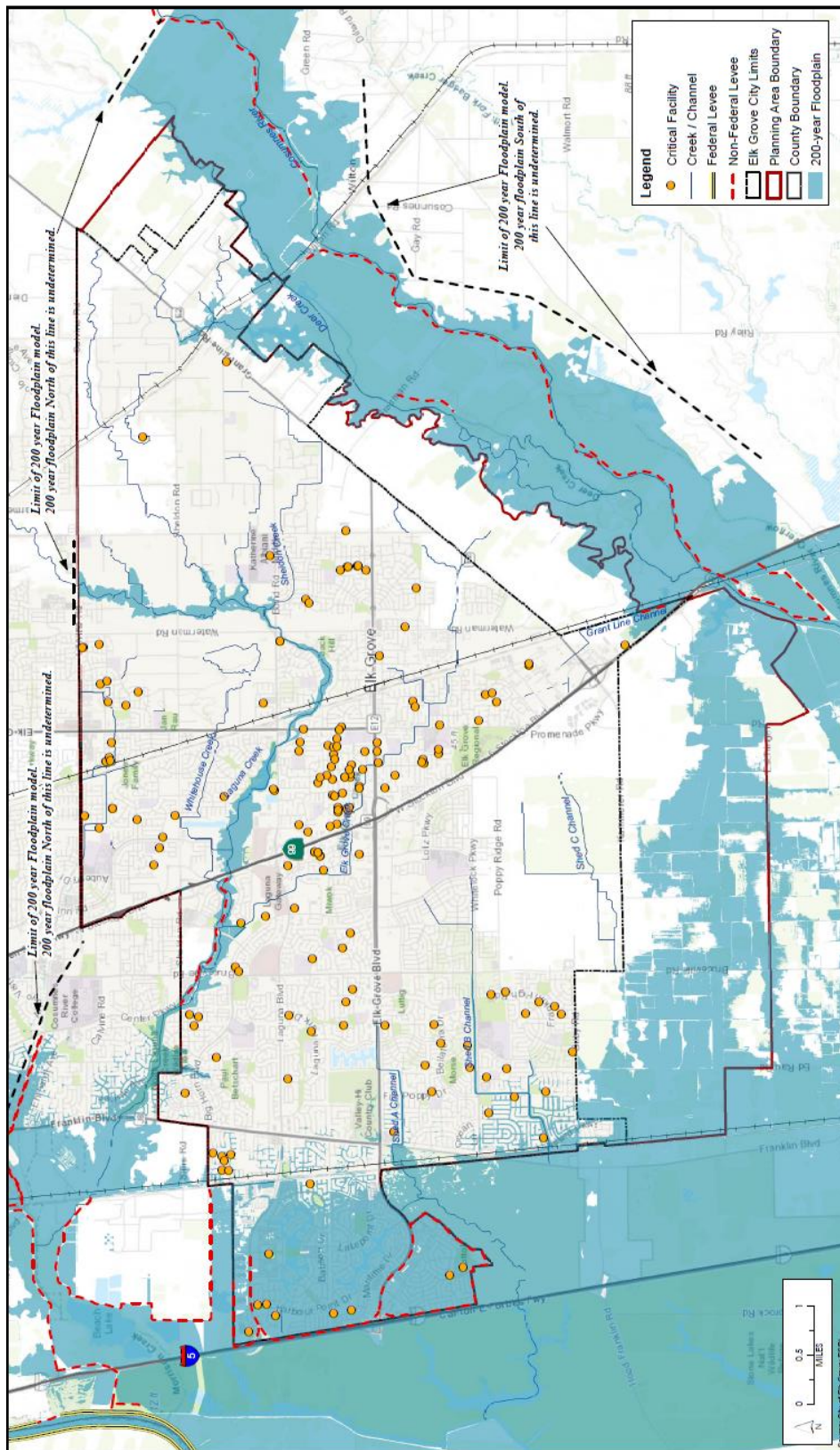
The City commissioned hydrologic modeling to supplement the DWR 200-year floodplain mapping of Laguna Creek to account for levee improvements completed or in process that were not included in the DWR mapping. The Sacramento Area Flood Control Agency (SAFCA) is in the process of implementing a levee improvement project to provide 200-year flood protection for the Sacramento River, and the US Army Corps of Engineers has completed improvements to the Folsom Dam spillway on the American River. These projects were not accounted for in the DWR mapping. Because of these improvements, the City’s supplemental 200-year floodplain calculations use a scenario in which the levees and dams along the Sacramento and American Rivers do not fail.

The City’s supplemental mapping also differs from DWR 200-year floodplain mapping by adding 200-year water surface elevations along Deer Creek. The DWR mapping did not assess Deer Creek since no State flood improvement projects are located in this watershed. Levees in this area have not been certified to provide 100-year protection and have failed in the past during large storm events. Therefore, modeling for this area considers the possibility of extensive levee failure, especially along the north bank of the Cosumnes River.

The area potentially affected by a 200-year flood event in the City is located along Deer Creek and the Cosumnes River. Much of this land is preserved for agricultural use and would be at limited risk of damage from flood hazard zones. However, a 200-year flood event caused by levee breaks along the Sacramento River could result in flooding in small portions of Laguna West, an existing residential neighborhood on the western side of the City. If, in the future, the City were to consider expanding beyond its existing Planning Area north or south along I-5, development in these areas would also be at risk in a 200-year flood event.

The City recognizes that flood risk conditions can change over time through natural processes or project improvements on the local or regional scale. Therefore, the 200-year flood map is considered the base case for establishing potential flood risk. The City will keep updated data on the 200-year floodplain through an annual review, accounting for the results of new technical studies and changes in flood protection infrastructure. This updated information will be referenced during the development review process for areas on the base case 200-year flood map, as shown in Figure B-16.

Figure B-16 City of Elk Grove – 0.5% (200-Year) Floodplain



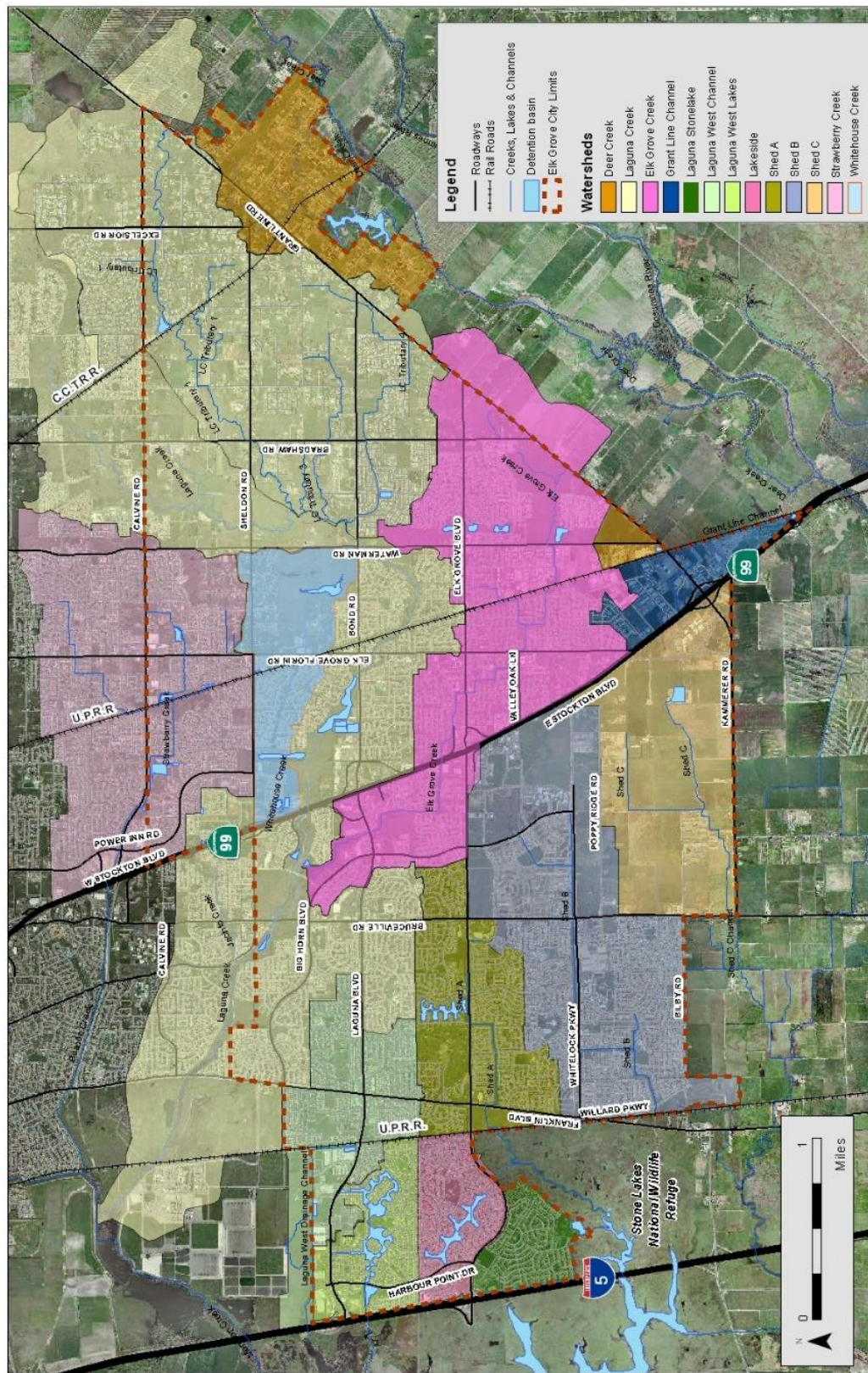
Source: City of Elk Grove General Plan 2018 Environmental Impact Report

### *Local Drainage and Flood Control*

The City inherited a traditional storm drainage and flood control system from Sacramento County upon incorporation in 2000 and this storm drainage collection and conveyance system, which consists of channels, creeks, ditches, pipes, streets and detention basins provides the City with a dependable means of minimizing the opportunities of flooding which can cause damage to the City's residents and infrastructure. The City's storm drainage and flood control system is continually undergoing expansion to accommodate new development flows as well as making improvements to the existing infrastructure in order to encourage nonstructural environmentally friendly storm drainage and flood control practices.

The drainage within the City is conveyed through a storm drainage and flood control system consisting of about 400 miles of underground pipes; and 60 miles of natural and constructed channels. The City drains within thirteen watersheds as delineated in Figure B-17. Within the watersheds there are ten major natural creeks or open channels (Figure B-17) that convey runoff within the City including Elk Grove Creek, Laguna Creek, Strawberry Creek, Whitehouse Creek, Deer Creek, Ehrhardt Channel, Franklin Creek, Shed C Channel, Grant Line Channel, and the Laguna West Channel. Four of the creeks, Elk Grove Creek, Laguna Creek, Strawberry Creek, and Deer Creek convey runoff that originates outside the City limits. All of the watersheds and channels located within the City, ultimately drain into the Stone Lakes National Wildlife Refuge floodplain with the exception of the Deer Creek and Grant Line Channel watersheds, which drain to Deer Creek and ultimately to the Cosumnes and Mokelumne Rivers.

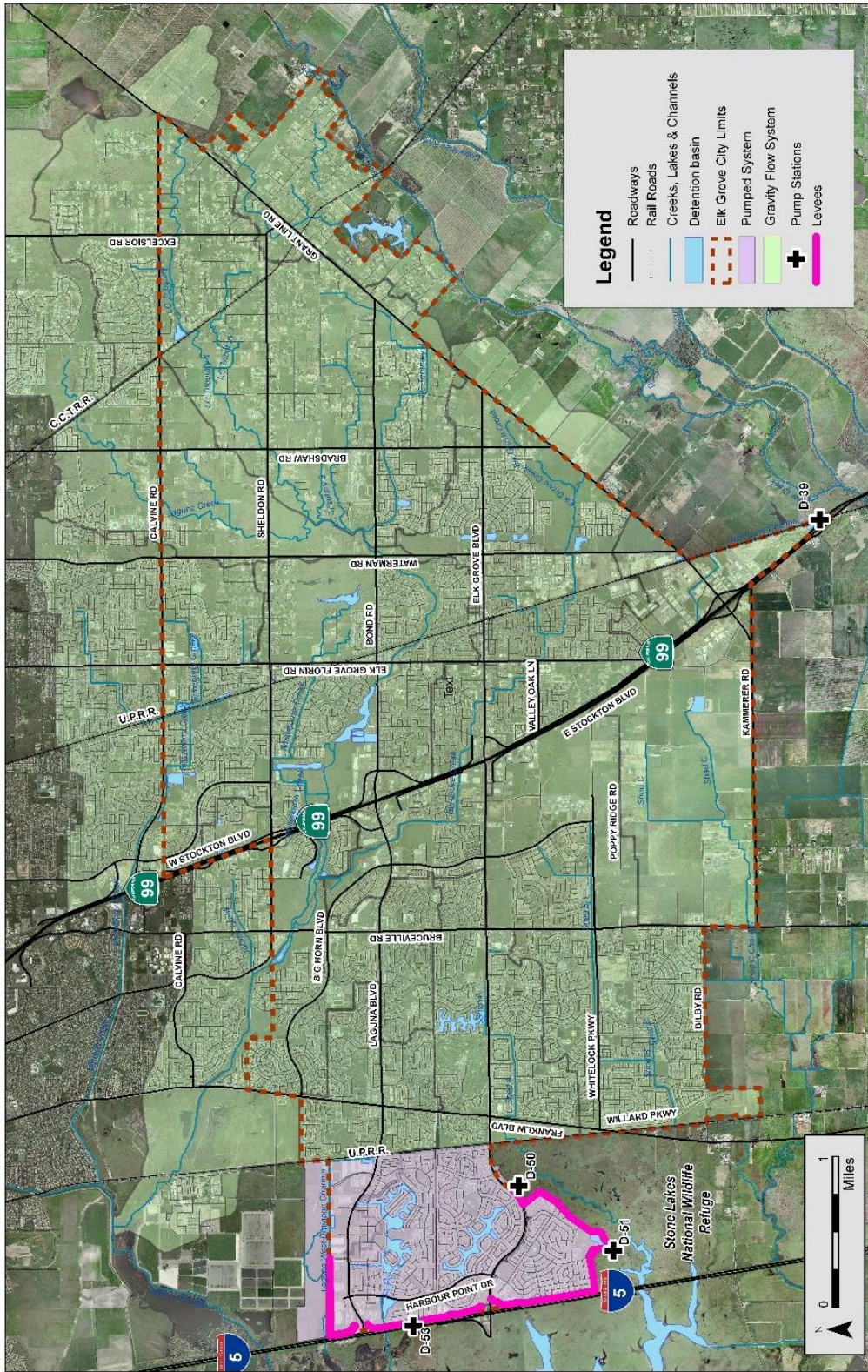
Figure B-17 City of Elk Grove Watershed Delineations, Creeks and Channels



Source: City of Elk Grove GIS

The City's storm drainage and flood control system can be characterized as a gravity flow system for the portion of the City east of the Union Pacific Railroad tracks and a pumped system west of the Union Pacific Railroad tracks for the area referred to as the Laguna West communities. The three pump stations for the Laguna West area are located in the Laguna West Channel, Lakeside and Laguna Stonelake watersheds. The Laguna West area is protected by a perimeter levee system which protects the communities from the backwater effects of the Cosumnes and Mokelumne Rivers. There is also a pump station located in the Grant Line Channel watershed. The City has nineteen detention basins that were primarily constructed in conjunction with commercial and residential development in order to mitigate project stormwater runoff flows to pre-project levels. Figure B-18 depicts the locations of the pump stations, levees, basins, and the gravity flow areas.

Figure B-18 City of Elk Grove Pump Stations, Levees, Detention Basins, and Gravity Flow Areas



Source: City of Elk Grove GIS

The majority of the City’s storm drainage and flood control system facilities and channels are owned by the City, with some portions being privately owned. The City owns and operates the storm drainage and flood control facilities, which consist of pump stations, levees, detention basins and other flood control features.

Current land use of properties adjacent to storm drainage, flood control facilities and channels vary widely, and include all types of land uses present within the City, such as commercial, residential, industrial, recreational, open space, small scale agricultural, mixed-use and public facilities. Underground drainage pipes are typically located within or adjacent to public roadways. Natural and constructed channels are typically maintained as open space, with some recreational uses, such as bicycle trails, located along the channel corridor in some areas of the City.

The eastern portion of the City (primarily east of Waterman Road) is predominately rural with residences built on large lots where agricultural practices are common. A majority of the East Elk Grove area/rural region does not have an underground pipe system, curbs or gutters. Stormwater is collected and conveyed by roadside ditches that have very limited flow carrying capacity. This results in roads experiencing flooding and standing water at a few locations. In some areas the roads may overtop, which impacts driving, particularly at night.

Along the eastern and southern edges of the City, the Cosumnes River represents a major flood hazard. The Cosumnes River is the last river in California, which remains undammed along its entire length, so flooding caused by this river can be extensive.

**Past Occurrences**

A list of state and federal disaster declarations for Sacramento County from flooding is shown on Table B-26. These events also likely affected the City to some degree.

*Table B-26 Sacramento County – State and Federal Disaster Declarations from Flood 1950-2020*

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	19	1950, 1955, 1958 (twice), 1963, 1969, 1982 (twice), 1983, 1986, 1995 (twice), 1996, 1997, 1998, 2008, 2017 (three times)	14	1955, 1958, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 1998, 2006, 2017 (three times)

Source: Cal OES, FEMA

The flooding in 2017 caused localized flooding and downed trees in the City. Many of the localized street flooding issues were due to maintenance practices, which have subsequently been corrected. Highway 99, a major transportation corridor through the City, was flooded just south of the City boundary. This is a result of the highway being on low ground and is being corrected by Caltrans. The Emerald Oaks Golf Course, on the southern tip of the City and immediately east of Hwy 99, also flooded by design as it is a flood basin.

## Vulnerability to and Impacts from Flood

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County and City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

One of the biggest concerns with major flooding is timely evacuation and access to vulnerable populations. The City is currently working on evacuation plans for hazardous events.

### Assets at Risk

Based on the vulnerability of Elk Grove to the flood hazard, the sections that follow describes significant assets at risk in the City of Elk Grove. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

### *Values at Risk*

GIS was used to determine the possible impacts of flooding within the City of Elk Grove. The methodology described in Section 4.3.12 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table B-27 is a summary table for the City of Elk Grove. Parcel counts, values, estimated contents, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table B-28 breaks down Table B-27 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA flood zones in the City.

The City noted that some of these parcels (that fall in Zone AE) were actually removed from the SFHA by a Letter of Map Revision from FEMA (the FEMA maps still show the areas in the SFHA since the maps have not been updated).

**Table B-27 City of Elk Grove – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones**

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	403	269	\$61,274,181	\$135,476,549	\$92,047,967	\$288,798,693
0.2% Annual Chance Flood Hazard	7,021	6,737	\$785,686,811	\$2,248,156,539	\$1,315,971,218	\$4,349,814,522
Other Areas	48,160	44,803	\$5,415,550,301	\$13,971,342,060	\$8,031,991,292	\$27,418,883,679
<b>City of Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: FEMA 11/2/2018 DFIRM, Sacramento County 2020 Parcel/Assessor's Data

\*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

\*\*This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

**Table B-28 City of Elk Grove – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
<b>1% Annual Chance Flood Hazard</b>						
<b>Zone A</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0
Care/Health	0	0	\$0	\$0	\$0	\$0
Church/Welfare	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Miscellaneous	26	0	\$99	\$0	\$0	\$99
Office	0	0	\$0	\$0	\$0	\$0
Public/Utilities	0	0	\$0	\$0	\$0	\$0
Recreational	0	0	\$0	\$0	\$0	\$0
Residential	3	0	\$0	\$0	\$0	\$0
Retail/Commercial	0	0	\$0	\$0	\$0	\$0
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	6	0	\$27	\$0	\$0	\$27
<b>Zone A Total</b>	<b>35</b>	<b>0</b>	<b>\$126</b>	<b>\$0</b>	<b>\$0</b>	<b>\$126</b>

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
<b>Zone AE</b>						
Agricultural	1	0	\$9	\$0	\$0	\$9
Care/Health	3	1	\$2,943,280	\$5,652,593	\$5,652,593	\$14,248,466
Church/Welfare	1	1	\$268,289	\$54,835	\$54,835	\$377,959
Industrial	3	2	\$817,755	\$1,317,876	\$1,976,814	\$4,112,445
Miscellaneous	54	0	\$437,414	\$0	\$0	\$437,414
Office	2	1	\$403,259	\$2,780,364	\$2,780,364	\$5,963,987
Public/Utilities	2	0	\$2	\$0	\$0	\$2
Recreational	1	1	\$470,772	\$1,524,986	\$1,524,986	\$3,520,744
Residential	257	254	\$40,188,748	\$88,175,049	\$44,087,529	\$172,451,322
Retail/Commercial	10	9	\$10,296,835	\$35,970,846	\$35,970,846	\$82,238,527
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	34	0	\$5,447,692	\$0	\$0	\$5,447,692
<b>Zone AE Total</b>	<b>368</b>	<b>269</b>	<b>\$61,274,055</b>	<b>\$135,476,549</b>	<b>\$92,047,967</b>	<b>\$288,798,567</b>
<b>1% Annual Chance Flood Hazard Total</b>	<b>403</b>	<b>269</b>	<b>\$61,274,181</b>	<b>\$135,476,549</b>	<b>\$92,047,967</b>	<b>\$288,798,693</b>
<b>0.2% Annual Chance Flood Hazard</b>						
<b>0.2% Annual Chance</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0
Care/Health	4	3	\$7,669,150	\$54,732,171	\$54,732,171	\$117,133,492
Church/Welfare	1	1	\$333,286	\$203,812	\$203,812	\$740,910
Industrial	9	9	\$4,616,628	\$12,397,077	\$18,595,615	\$35,609,321
Miscellaneous	128	0	\$85,875	\$0	\$0	\$85,875
Office	5	4	\$2,829,252	\$8,350,409	\$8,350,409	\$19,530,070
Public/Utilities	3	0	\$9	\$0	\$0	\$9
Recreational	4	4	\$4,200,131	\$16,354,956	\$16,354,956	\$36,910,043
Residential	4,038	4,033	\$380,639,074	\$1,044,687,963	\$522,344,013	\$1,947,671,034
Retail/Commercial	30	30	\$35,104,712	\$85,390,336	\$85,390,336	\$205,885,384
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	35	1	\$10,273,306	\$4,123	\$0	\$10,277,429
<b>0.2% Annual Chance Total</b>	<b>4,257</b>	<b>4,085</b>	<b>\$445,751,423</b>	<b>\$1,222,120,847</b>	<b>\$705,971,312</b>	<b>\$2,373,843,567</b>
<b>X Protected by Levee</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Care/Health	1	1	\$745,000	\$1,735,000	\$1,735,000	\$4,215,000
Church/Welfare	4	4	\$4,115,302	\$15,770,564	\$15,770,564	\$35,656,430
Industrial	6	3	\$9,383,367	\$20,127,566	\$30,191,348	\$59,702,281
Miscellaneous	60	0	\$584	\$0	\$0	\$584
Office	51	44	\$14,324,891	\$93,962,948	\$93,962,948	\$202,250,787
Public/Utilities	0	0	\$0	\$0	\$0	\$0
Recreational	1	1	\$520,200	\$1,500,000	\$1,500,000	\$3,520,200
Residential	2,584	2,567	\$269,922,489	\$852,199,179	\$426,099,611	\$1,548,221,248
Retail/ Commercial	34	32	\$23,045,949	\$40,740,435	\$40,740,435	\$104,526,819
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	23	0	\$17,877,606	\$0	\$0	\$17,877,606
<b>X Protected by Levee Total</b>	<b>2,764</b>	<b>2,652</b>	<b>\$339,935,388</b>	<b>\$1,026,035,692</b>	<b>\$609,999,906</b>	<b>\$1,975,970,955</b>
<b>0.2% Annual Chance Flood Hazard Total</b>	<b>7,021</b>	<b>6,737</b>	<b>\$785,686,811</b>	<b>\$2,248,156,539</b>	<b>\$1,315,971,218</b>	<b>\$4,349,814,522</b>
<b>Other Areas</b>						
<b>Zone X</b>						
Agricultural	18	7	\$1,376,338	\$1,239,312	\$1,239,312	\$3,854,962
Care/Health	28	22	\$26,582,628	\$90,844,343	\$90,844,343	\$208,271,314
Church/Welfare	45	41	\$27,910,629	\$115,055,115	\$115,055,115	\$258,020,859
Industrial	188	161	\$85,608,395	\$295,769,280	\$443,653,914	\$825,031,599
Miscellaneous	1,320	1	\$841,892	\$1,100	\$1,100	\$844,092
Office	268	247	\$83,592,828	\$426,140,488	\$426,140,488	\$935,873,804
Public/Utilities	67	0	\$99	\$0	\$0	\$99
Recreational	14	10	\$8,630,215	\$35,594,899	\$35,594,899	\$79,820,013
Residential	44,126	43,925	\$4,421,924,222	\$12,149,570,110	\$6,074,785,117	\$22,646,279,465
Retail/ Commercial	359	329	\$320,907,843	\$844,677,004	\$844,677,004	\$2,010,261,851
Unknown	1	1	\$0	\$127,600	\$0	\$127,600
Vacant	1,726	59	\$438,175,212	\$12,322,809	\$0	\$450,498,021
<b>Zone X Total</b>	<b>48,160</b>	<b>44,803</b>	<b>\$5,415,550,301</b>	<b>\$13,971,342,060</b>	<b>\$8,031,991,292</b>	<b>\$27,418,883,679</b>
<b>Other Areas Total</b>	<b>48,160</b>	<b>44,803</b>	<b>\$5,415,550,301</b>	<b>\$13,971,342,060</b>	<b>\$8,031,991,292</b>	<b>\$27,418,883,679</b>
<b>Elk Grove Total</b>						
<b>Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: FEMA 11/2/2018 DFIRM, Sacramento County 2020 Parcel/Assessor's Data

\*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

\*\*This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table B-29 summarizes Table B-28 above and shows City of Elk Grove loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

*Table B-29 City of Elk Grove – Flood Loss Estimates*

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	403	269	\$135,476,549	\$92,047,967	\$227,524,516	\$45,504,903	0.03%
0.2% Annual Chance Flood Hazard	7,021	6,737	\$2,248,156,539	\$1,315,971,218	\$3,564,127,757	\$712,825,551	0.40%
<b>Grand Total</b>	<b>7,424</b>	<b>7,006</b>	<b>\$2,383,633,088</b>	<b>\$1,408,019,185</b>	<b>\$3,791,652,273</b>	<b>\$758,330,454</b>	<b>0.43%</b>

Source: FEMA 11/2/2018 DFIRM, Sacramento County 2020 Parcel/Assessor's Data

\*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

\*\*This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table B-28 and Table B-29, the City of Elk Grove has 269 parcels and \$227.5 million of structure and contents values or values in the 1% annual chance flood zone, and 6,737 improved parcels and \$3.56 billion of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, there is a 1% chance in any given year of a flood event causing \$45.4 million in damage and a 0.2% chance in any given year of a flood event causing \$712.8 million in damage in the City of Elk Grove. The loss ratio of 0.03% and 0.40% indicates that flood losses for 1% and 0.2% annual chance flooding, respectively, would be somewhat minor relative to the total values of structures in the City.

### *Flooded Acres*

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.12 of the Base Plan, was used for the City of Elk Grove as well as for the County as a whole. Table B-30 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

*Table B-30 City of Elk Grove – Flooded Acres by Flood Zone*

Flood Zone/ Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
<b>1% Annual Chance Flood Hazard</b>						
<b>Zone A</b>						
Agricultural	0.0	0.00%	0.0	0.00%	0.0	0.00%
Care/Health	0.0	0.00%	0.0	0.00%	0.0	0.00%
Church/Welfare	0.0	0.00%	0.0	0.00%	0.0	0.00%
Industrial	0.0	0.00%	0.0	0.00%	0.0	0.00%
Miscellaneous	92.3	0.35%	0.0	0.00%	92.3	0.00%
Office	0.0	0.00%	0.0	0.00%	0.0	1.22%
Public/Utilities	2.6	0.01%	0.0	0.00%	2.6	0.00%
Recreational	0.0	0.00%	0.0	0.00%	0.0	0.03%
Residential	32.2	0.12%	11.8	0.06%	20.5	0.00%
Retail/ Commercial	0.0	0.00%	0.0	0.00%	0.0	0.27%
Unknown	0.0	0.00%	0	0.00%	0.0	0.00%
Vacant	48.8	0.18%	0	0.00%	48.8	0.00%
<b>Zone A Total</b>	<b>176.0</b>	<b>0.66%</b>	<b>11.8</b>	<b>0.06%</b>	<b>164.2</b>	<b>0.65%</b>
<b>Zone AE</b>						
Agricultural	25.8	0.10%	0.0	0.00%	25.8	0.34%
Care/Health	97.3	0.37%	52.3	0.28%	45.1	0.60%
Church/Welfare	6.0	0.02%	6.0	0.03%	0	0.00%
Industrial	11.8	0.04%	11.3	0.06%	0.5	0.01%
Miscellaneous	282.1	1.06%	0.0	0.00%	282.1	3.73%
Office	17.7	0.07%	0.6	0.00%	17.1	0.23%
Public/Utilities	16.8	0.06%	0.0	0.00%	16.8	0.22%
Recreational	4.4	0.02%	4.4	0.02%	0.0	0.00%
Residential	378.2	1.42%	369.8	1.95%	8.4	0.11%
Retail/ Commercial	16.4	0.06%	15.3	0.08%	1.1	0.01%
Unknown	0.0	0.00%	0.0	0.00%	0.0	0.00%
Vacant	227.8	0.86%	0.0	0.00%	227.8	3.01%
<b>Zone AE Total</b>	<b>1,084.3</b>	<b>4.08%</b>	<b>459.6</b>	<b>2.42%</b>	<b>624.7</b>	<b>8.26%</b>
<b>Zone AH</b>						
Agricultural	0.0	0.00%	0.0	0.00%	0.0	0.00%
Care/Health	0.0	0.00%	0.0	0.00%	0.0	0.00%
Church/Welfare	5.7	0.02%	5.7	0.03%	0.0	0.00%

Flood Zone/ Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Industrial	0.0	0.00%	0.0	0.00%	0.0	0.00%
Miscellaneous	0.2	0.00%	0.0	0.00%	0.2	0.00%
Office	0.0	0.00%	0.0	0.00%	0.0	0.00%
Public/Utilities	0.0	0.00%	0.0	0.00%	0.0	0.00%
Recreational	0.0	0.00%	0.0	0.00%	0.0	0.00%
Residential	0.0	0.00%	0.0	0.00%	0.0	0.00%
Retail/ Commercial	0.0	0.00%	0.0	0.00%	0.0	0.00%
Unknown	0.0	0.00%	0.0	0.00%	0.0	0.00%
Vacant	0.0	0.00%	0.0	0.00%	0.0	0.00%
<b>Zone AH Total</b>	<b>5.9</b>	<b>0.02%</b>	<b>5.7</b>	<b>0.03%</b>	<b>0.2</b>	<b>0.00%</b>
<b>Zone AO</b>						
Agricultural	0.0	0.00%	0.0	0.00%	0.0	0.00%
Care/Health	0.0	0.00%	0.0	0.00%	0.0	0.00%
Church/Welfare	0.0	0.00%	0.0	0.00%	0.0	0.00%
Industrial	0.0	0.00%	0.0	0.00%	0.0	0.00%
Miscellaneous	0.0	0.00%	0.0	0.00%	0.0	0.00%
Office	0.0	0.00%	0.0	0.00%	0.0	0.00%
Public/Utilities	0.0	0.00%	0.0	0.00%	0.0	0.00%
Recreational	0.0	0.00%	0.0	0.00%	0.0	0.00%
Residential	0.3	0.00%	0.3	0.00%	0.0	0.00%
Retail/ Commercial	0.0	0.00%	0.0	0.00%	0.0	0.00%
Unknown	0.0	0.00%	0.0	0.00%	0.0	0.00%
Vacant	0.0	0.00%	0.0	0.00%	0.0	0.00%
<b>Zone AO Total</b>	<b>0.3</b>	<b>0.00%</b>	<b>0.3</b>	<b>0.00%</b>	<b>0.0</b>	<b>0.00%</b>
<b>1% Annual Chance Flood Hazard Total</b>	<b>1,266.4</b>	<b>4.77%</b>	<b>477.4</b>	<b>2.51%</b>	<b>789.0</b>	<b>10.44%</b>
<b>0.2% Annual Chance Flood Hazard</b>						
<b>0.2% Annual Chance</b>						
Agricultural	2.0	0.01%	0.0	0.00%	2.0	0.03%
Care/Health	27.4	0.10%	21.2	0.11%	6.2	0.08%
Church/Welfare	10.5	0.04%	10.5	0.06%	0.0	0.00%
Industrial	19.7	0.07%	19.4	0.10%	0.3	0.00%
Miscellaneous	126.2	0.48%	0.0	0.00%	126.2	1.67%
Office	8.0	0.03%	3.8	0.02%	4.2	0.06%

Flood Zone/ Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Public/Utilities	36.2	0.14%	0.0	0.00%	36.2	0.48%
Recreational	6.6	0.02%	6.6	0.03%	0.0	0.00%
Residential	718.5	2.71%	716.5	3.77%	2.0	0.03%
Retail/ Commercial	54.6	0.21%	54.2	0.29%	0.3	0.00%
Unknown	0	0.00%	0	0.00%	0	0.00%
Vacant	200.3	0.75%	1.0	0.01%	199.3	2.64%
<b>0.2% Annual Chance Total</b>	<b>1,210.0</b>	<b>4.56%</b>	<b>833.2</b>	<b>4.39%</b>	<b>376.8</b>	<b>4.98%</b>
<b>X Protected by Levee</b>						
Agricultural	0.0	0.00%	0.0	0.00%	0.0	0.00%
Care/Health	1.4	0.01%	1.4	0.01%	0.0	0.00%
Church/Welfare	15.2	0.06%	15.2	0.08%	0.0	0.00%
Industrial	25.5	0.10%	21.9	0.12%	3.7	0.05%
Miscellaneous	83.8	0.32%	0.0	0.00%	83.8	1.11%
Office	60.2	0.23%	49.8	0.26%	10.4	0.14%
Public/Utilities	0.1	0.00%	0.0	0.00%	0.1	0.00%
Recreational	1.0	0.00%	1.0	0.01%	0.0	0.00%
Residential	1,672.3	6.30%	1,646.2	8.67%	26.0	0.34%
Retail/ Commercial	46.5	0.18%	38.4	0.20%	8.1	0.11%
Unknown	0.0	0.00%	0.0	0.00%	0.0	0.00%
Vacant	59.7	0.22%	0.0	0.00%	59.7	0.79%
<b>X Protected by Levee Total</b>	<b>1,965.7</b>	<b>7.40%</b>	<b>1,773.9</b>	<b>9.34%</b>	<b>191.8</b>	<b>2.54%</b>
<b>0.2% Annual Chance Flood Hazard Total</b>	<b>3,175.7</b>	<b>11.96%</b>	<b>2,607.1</b>	<b>13.72%</b>	<b>568.6</b>	<b>7.52%</b>
<b>Other Areas</b>						
<b>Zone X</b>						
Agricultural	489.0	1.84%	331.2	1.74%	157.8	2.09%
Care/Health	82.1	0.31%	57.0	0.30%	25.1	0.33%
Church/Welfare	177.8	0.67%	157.0	0.83%	20.9	0.28%
Industrial	521.6	1.96%	441.5	2.32%	80.1	1.06%
Miscellaneous	1,497.6	5.64%	0.0	0.00%	1,497.6	19.81%
Office	592.1	2.23%	523.1	2.75%	69.0	0.91%
Public/Utilities	506.6	1.91%	0	0.00%	506.6	6.70%
Recreational	255.3	0.96%	206.7	1.09%	48.6	0.64%

Flood Zone/ Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Residential	13,308.0	50.11%	13,092.1	68.92%	215.8	2.86%
Retail/ Commercial	667.8	2.51%	636.3	3.35%	31.5	0.42%
Unknown	0.1	0.00%	0.1	0.00%	0	
Vacant	4,015.9	15.12%	466.7	2.46%	3,549.1	46.95%
Agricultural	22,113.8	83.27%	15,911.5	83.76%	6,202.2	82.04%
<b>Other Areas Total</b>	<b>22,113.8</b>	<b>83.27%</b>	<b>15,911.5</b>	<b>83.76%</b>	<b>6,202.2</b>	<b>82.04%</b>
<b>Elk Grove Total</b>	<b>26,555.9</b>	<b>100.0%</b>	<b>18,996.0</b>	<b>100.0%</b>	<b>7,559.9</b>	<b>100.0%</b>

Source: FEMA 11/2/2018 DFIRM

### *Population at Risk*

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Elk Grove – 3.20. According to this analysis, there is a total population of 813 and 12,906 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table B-31.

*Table B-31 City of Elk Grove – Count of Improved Residential Parcels and Population by Flood Zone*

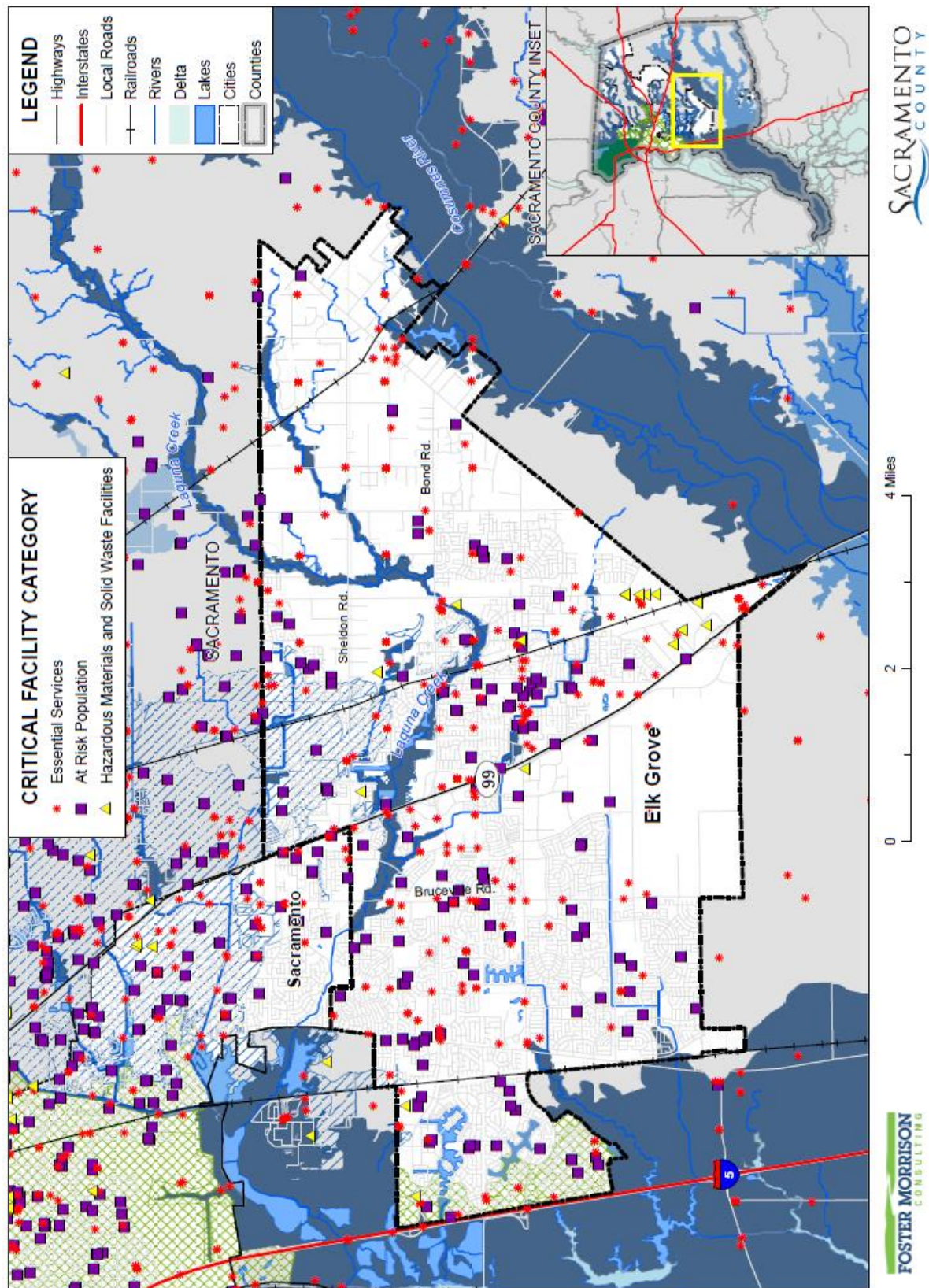
Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Elk Grove	254	813	4,033	12,906

Source: FEMA DFIRM 11/2/2018, Sacramento County 2020 Parcel/Assessor's Data, US Census Bureau

### *Critical Facilities at Risk*

An analysis was performed on the critical facility inventory in Elk Grove in identified DFIRM flood zones. GIS was used to determine whether the critical facility locations intersect a DFIRM flood zones and if so, which zone it intersects. Details of critical facilities in mapped dam inundation areas in the City of Elk Groves are shown in Figure B-19 and detailed in Table B-32. Details of critical facility definition, type, name and address and jurisdiction by DFIRM flood zones are listed in Appendix F.

Figure B-19 City of Elk Grove – Critical Facilities and DFIRM Flood Zones



Data Source: FEMA NFHL 07/19/2018, Sacramento County GIS, Cal-Atlas, Map Date: 08/2021.

*Table B-32 City of Elk Grove – Critical Facilities in FEMA DFIRM Flood Zones by Category and Type*

Flood Zone Critical Facility Category	Critical Facility Type	Facility Count
<b>1% Annual Chance Flood Hazard</b>		
Essential Services Facilities	FDIC Insured Banks	1
	Water Well	2
	<b>Total</b>	<b>3</b>
At Risk Population Facilities	Places of Worship	1
	<b>Total</b>	<b>1</b>
<b>1% Annual Chance Flood Hazard Total</b>		<b>4</b>
<b>0.2% Annual Chance Flood Hazard</b>		
Essential Services Facilities	Emergency Evacuation Center	1
	EMS Stations	1
	FDIC Insured Banks	5
	Fire Station	1
	Microwave Service Towers	17
	Water Well	13
	<b>Total</b>	<b>38</b>
At Risk Population Facilities	Day Care Center	4
	Places of Worship	6
	School	5
	<b>Total</b>	<b>15</b>
Hazardous Materials and Solid Waste Facilities	Leaky Underground Storage Tank	1
	<b>Total</b>	<b>1</b>
<b>0.2% Annual Chance Flood Hazard Total</b>		<b>54</b>
<b>Other Areas</b>		
Essential Services Facilities	Cellular Tower	2
	Emergency Evacuation Center	7
	EMS Stations	6
	FDIC Insured Banks	20
	Fire Station	5
	Hospital or Urgent Care	1
	Law Enforcement	2
	Microwave Service Towers	90
	Sewage Treatment Plant	1
	Water Well	143
	<b>Total</b>	<b>277</b>
At Risk Population Facilities	Day Care Center	32

Flood Zone Critical Facility Category	Critical Facility Type	Facility Count
	Mobile Home Parks	1
	Places of Worship	82
	School	40
	<b>Total</b>	<b>155</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	6
	EPA ER TSCA Facility	3
	Leaky Underground Storage Tank	3
	Solid Waste Facility	4
	Waste Transfer Station	1
	<b>Total</b>	<b>17</b>
<b>Other Areas Total</b>		<b>449</b>
<b>Elk Grove Total</b>		<b>507</b>

Source: City of Elk Grove, FEMA 7/19/2018 DFIRM

### Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

The City of Elk Grove joined the National Flood Insurance Program (NFIP) on October 15, 2001. The City does not participate in CRS program. NFIP data indicates that as of March 24, 2020, there were 1,002 flood insurance policies in force in the City with \$337,426,500 of coverage. Of the 1,002 policies, 986 were residential (single-family homes) and 16 were non-residential. Of the 1,002 policies, 33 were in the A zones, while 979 in B, C, and X zones. There have been 5 historical claims for flood losses totaling \$103,021.75. NFIP data further indicates that there are no repetitive loss (RL) or severe repetitive loss (SRL) buildings in Elk Grove. There have been no substantial damage claims.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 269 improved parcels within the 1% annual chance flood zone, only 33 (or 12.3 percent) of those parcels maintain flood insurance. This can be seen on Table B-33.

*Table B-33 City of Elk Grove – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain*

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Elk Grove	269	33	12.3%

Source: FEMA DFIRM 11/2/2018, Sacramento County 2020 Parcel/Assessor's Data

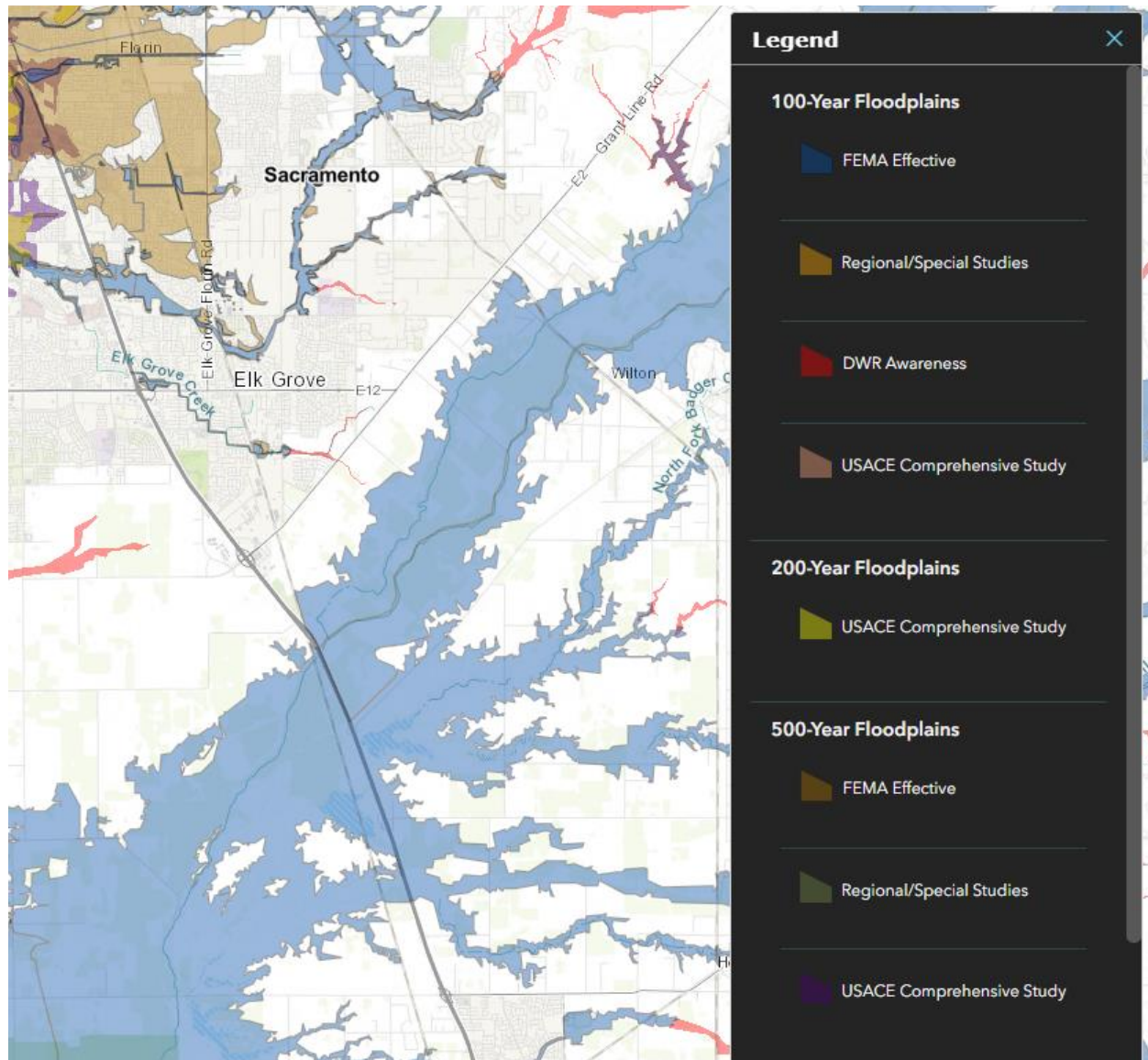
***California Department of Water Resources Best Available Maps (BAM)***

The FEMA regulatory maps provide just one perspective on flood risks in Sacramento County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for Elk Grove is shown in Figure B-20.

Figure B-20 City of Elk Grove – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

## Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain

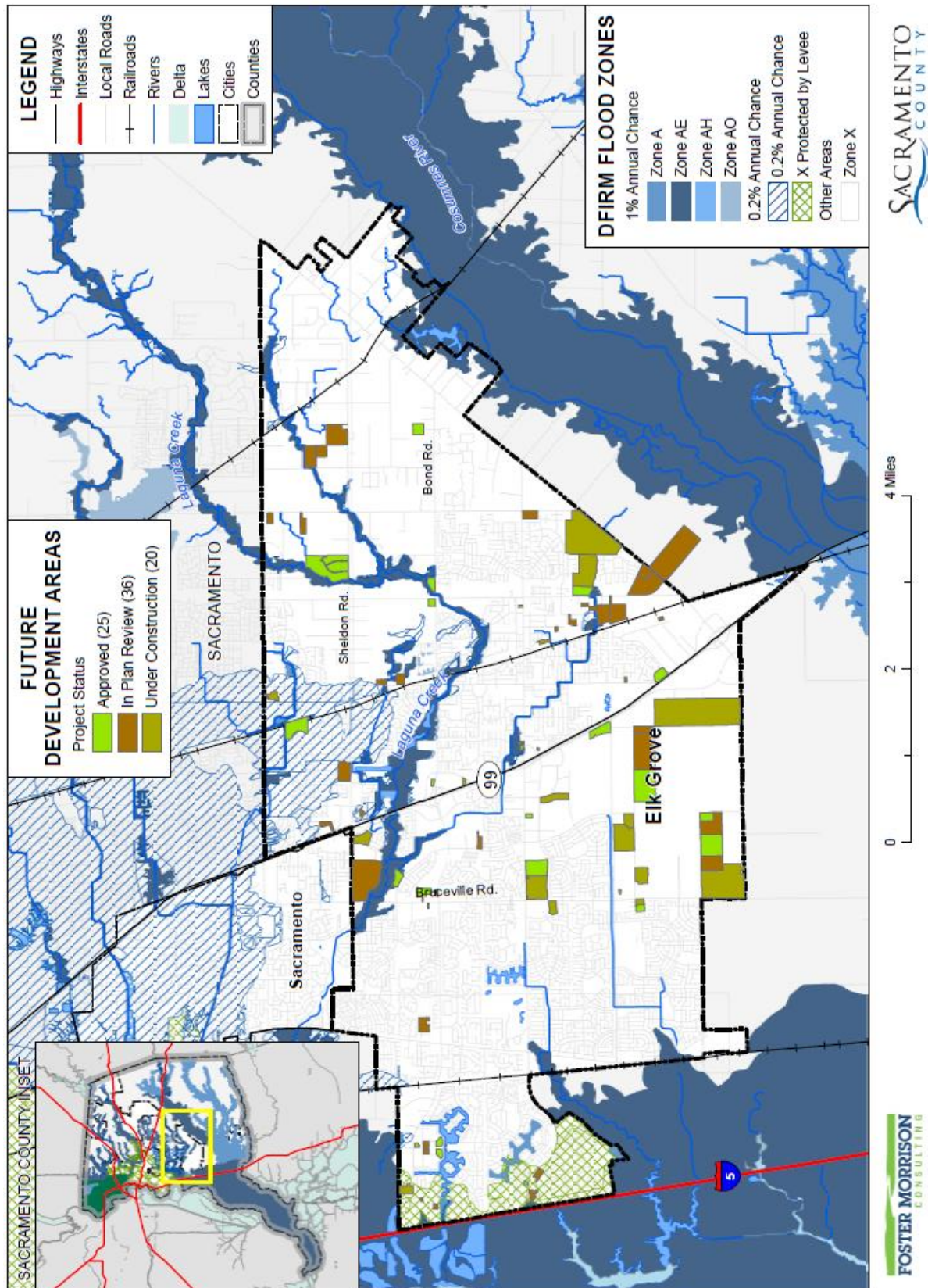
management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

The City enforces Chapter 16.50 of the Elk Grove Municipal Code (EGMC) - Flood Damage Prevention. If development is to occur in the floodplain, it is required to conform to the elevation and other standards of the EGMC. While the use of fill to create buildable area is strongly discouraged by City policy, should it be allowed, there shall be no net increase to the water surface elevation adjacent to, downstream, and upstream of the development, as determined by the City. Other improvements may be required as part of the proposed project. A Conditional Letter of Map Revision (CLOMR) issued by FEMA shall be required prior to grading permit issuance, unless only a Letter of Map Revision (LOMR) is required. A LOMR issued by FEMA shall be required prior to issuance of the first building permit.

### *GIS Analysis*

The City provided future development areas were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-21 shows the locations of future development areas the City is planning to develop on the DFIRM flood zones. Table B-34 shows the parcels and acreages of each future development area in the City in the DFIRM flood zones.

Figure B-21 City of Elk Grove – DFIRM Flood Zones and Future Development



*Table B-34 City of Elk Grove – DFIRM Flood Zones and Future Development Areas*

Flood Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>1% Annual Chance Flood Hazard</b>			
<b>Zone AE</b>			
<i>Approved</i>			
Sheldon Park Estates North Gated Community	5	0	10.4
Shell Gas Station	1	0	1.0
<b>Approved Total</b>	<b>6</b>	<b>0</b>	<b>11.4</b>
<i>In Plan Review</i>			
8633 Bader Road Map	1	1	20.3
Elk Grove Muslim Center	1	1	2.4
<b>In Plan Review Total</b>	<b>2</b>	<b>2</b>	<b>22.6</b>
<b>Zone AE Total</b>	<b>8</b>	<b>2</b>	<b>34.1</b>
<b>1% Annual Chance Flood Hazard Total</b>	<b>8</b>	<b>2</b>	<b>34.1</b>
<b>0.2% Annual Chance Flood Hazard</b>			
<b>0.2% Annual Chance</b>			
<i>Approved</i>			
Sheldon Park Estates North Gated Community	1	0	18.7
T-Mobile Jones Family Park	1	0	26.7
<b>Approved Total</b>	<b>2</b>	<b>0</b>	<b>45.3</b>
<i>In Plan Review</i>			
Hotel at Sheldon Place	1	0	2.3
Sheldon Grove Subdivision	1	0	19.8
<b>In Plan Review Total</b>	<b>2</b>	<b>0</b>	<b>22.0</b>
<i>Under Construction</i>			
Calvine Pointe	1	0	7.1
<b>Under Construction Total</b>	<b>1</b>	<b>0</b>	<b>7.1</b>
<b>0.2% Annual Chance Total</b>	<b>5</b>	<b>0</b>	<b>74.5</b>
<b>X Protected by Levee</b>			
<i>Approved</i>			
Arco AM/PM Car Wash Expansion	1	1	1.2
<b>Approved Total</b>	<b>1</b>	<b>1</b>	<b>1.2</b>
<i>In Plan Review</i>			
California Northstate University Medical Center	6	5	5.3
Candlewood Hotel	1	0	1.9
Elk Grove Independent Senior Housing	2	0	5.2
Wendy's Remodel	1	1	0.8

Flood Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b><i>In Plan Review Total</i></b>	<b><i>10</i></b>	<b><i>6</i></b>	<b><i>13.1</i></b>
<b><i>Under Construction</i></b>			
Cafeteria Expansion	1	1	9.2
<b><i>Under Construction Total</i></b>	<b><i>1</i></b>	<b><i>1</i></b>	<b><i>9.2</i></b>
<b>X Protected by Levee Total</b>	<b>12</b>	<b>8</b>	<b>23.5</b>
<b>0.2% Annual Chance Flood Hazard Total</b>	<b>17</b>	<b>8</b>	<b>98.0</b>
<b>Other Areas</b>			
<b>Zone X</b>			
<b><i>Approved</i></b>			
AAA Services Building	1	0	0.7
Bond Road Rezone and Tentative Map	2	2	10.1
Buffalo Wild Wings	1	0	1.0
Creekside Estates	1	0	7.0
Crooked Creek Industrial Park	2	1	14.2
Dignity Health Medical Campus	7	1	28.0
Elk Grove Masonic Lodge	1	0	0.7
GreenSpace Self Storage Facility	1	0	3.0
Laguna West Plaza Pads 1 & 2	2	0	1.6
New Faze Skilled Nursing	1	0	15.1
Poppy Keys Southwest	3	0	60.2
Quail Run II	1	0	4.8
Raising Cane's Restaurant	1	1	1.7
Seasons at Stonebrook Master Home Plan	3	0	79.5
Sheldon Park Estates North Gated Community	22	9	42.8
Shell with 7-Eleven & Storage Facility	4	0	4.5
Target Exterior Remodel	1	1	10.1
T-Mobile Evergreen Springs	1	1	2.3
Toscano Apartments	2	0	7.9
Trojan Storage II	1	0	8.9
U-Haul	4	0	10.2
Vineyard at Madeira Pad E	1	0	0.7
<b><i>Approved Total</i></b>	<b><i>63</i></b>	<b><i>16</i></b>	<b><i>315.2</i></b>
<b><i>In Plan Review</i></b>			
10069 Elk Grove Florin Road TPM	1	1	1.1
10075 Sheldon Road Tentative Parcel Map	1	1	35.3
8580 Bradshaw Road	1	0	8.3

Flood Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
8651 Bader Road TPM and Rezone	1	1	10.0
9730 Kent Street Addition	1	0	1.3
Bartholomew Vineyard Amendment	1	1	10.3
Bow Stockton Apartments	2	1	5.6
Burger King Remodel	1	1	0.7
Eden Gardens Banquet Hall	1	1	5.2
Elk Grove Food Bank	1	1	2.0
Elk Grove Muslim Center	1	0	4.6
Grant Line Construction Aggregate Production and Recycling Facility	1	0	24.8
In-N-Out Burger - The Ridge Pad 14	1	0	0.9
Kubota Tractor Corporation	1	1	101.6
Laguna Main Street Apartments	4	0	5.8
Laguna Springs Corporate Center - Building A	1	0	4.9
Life Storage Expansion	1	0	4.6
Mendes Villages 2 & 3	1	0	30.6
Mountain Elk Villas	1	0	12.1
Poppy Keys Southeast	4	0	66.5
S&J Storage	1	0	4.3
Sheldon Farms MHP	2	0	80.9
Tegan Estates	3	3	11.9
Telos Greens TSM and Rezone	1	0	26.4
Tractor Supply Company	1	0	67.4
Triangle Point TSM Phase 2	1	0	67.4
Warda Warehouse 3	1	0	1.5
Waterman Brinkman Logistics Center	3	1	21.6
<b>In Plan Review Total</b>	<b>40</b>	<b>13</b>	<b>617.7</b>
<b><i>Under Construction</i></b>			
Bruceville Meadows Residential	253	0	96.5
Bruceville Point	2	1	8.3
Fieldstone North and South	514	234	113.6
Fortune School	2	0	40.0
Madeira South (Poppy Lane)	221	92	35.1
Madeira South Lot A Master House Plans	1	0	10.6
McGeary Ranch	84	3	13.3
Mendes Subdivision	1	0	39.5
Milestone	126	29	45.5

Flood Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
Railroad Street	4	1	3.2
Sheldon Farms North	1	0	43.8
Sheldon Terrace	204	74	14.3
Sterling Meadows	623	444	172.2
The Gardens at Quail Run	1	0	4.4
The Park Senior Housing	3	0	15.1
The Ridge Shopping Center	20	8	39.6
Towneplace Suites	1	1	1.7
Wienerschnitzel	1	0	0.4
<b><i>Under Construction Total</i></b>	<b><i>2,062</i></b>	<b><i>887</i></b>	<b><i>697.2</i></b>
<b>Zone X Total</b>	<b>2,165</b>	<b>916</b>	<b>1,630.1</b>
<b>Other Areas Total</b>	<b>2,165</b>	<b>916</b>	<b>1,630.1</b>
<b>Grand Total</b>	<b>2,190</b>	<b>926</b>	<b>1,762.1</b>

Source: City of Elk Grove GIS, FEMA 7/19/2018 DFIRM

### ***Flood: Localized Stormwater Flooding***

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. This may produce localized street flooding due to high water in the waterway/creek systems. The previous discussion in the Flood: 1%/0.2% Annual Chance section included detailed information of the City’s drainage and localized creek systems that during these heavy rains can be overwhelmed and cause flooding.

### **Location and Extent**

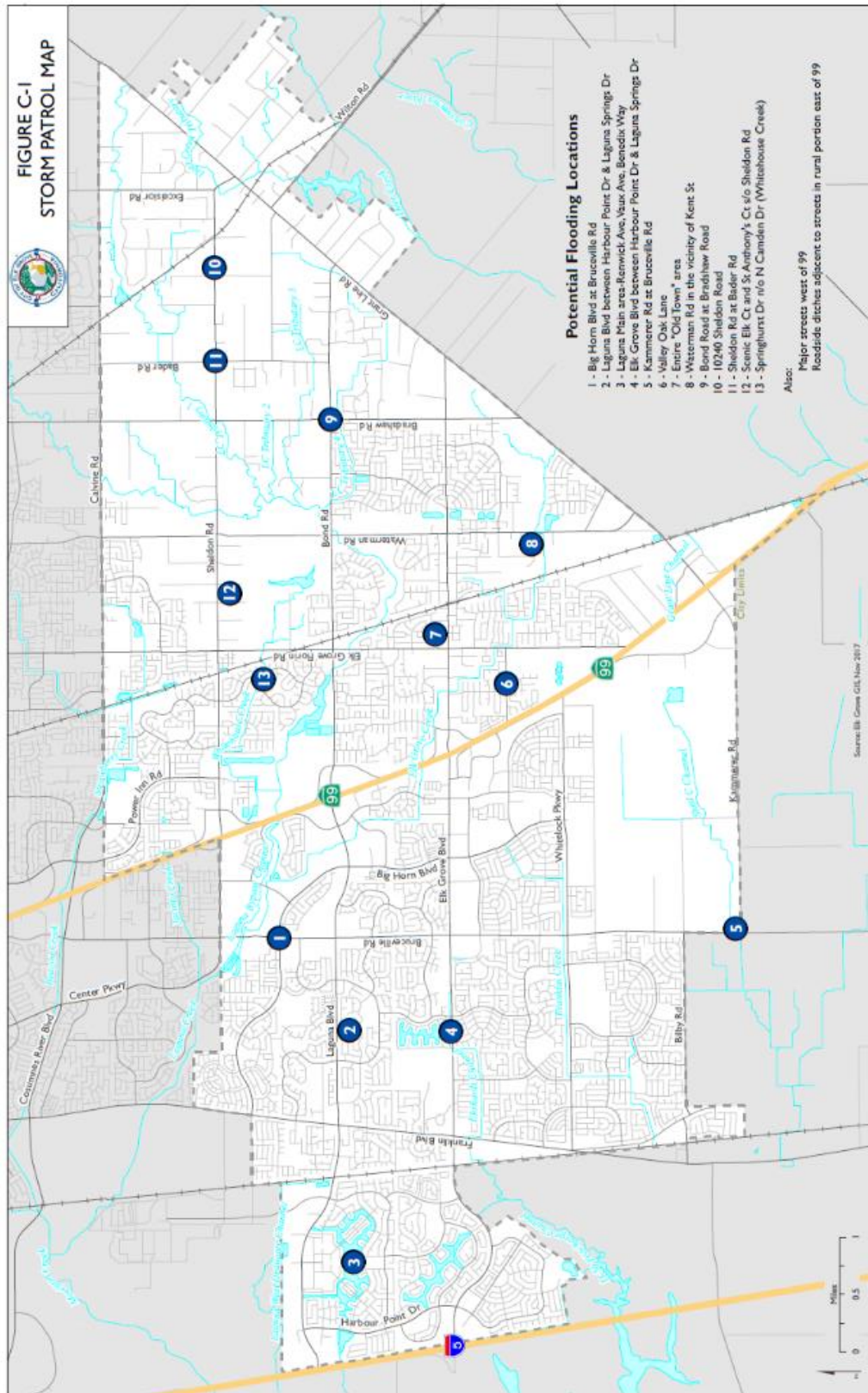
The City of Elk Grove is subject to localized flooding throughout the City. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

The East Elk Grove area and rural area has localized flooding which is widespread but generally minor. These areas of potential concern are included in Figure B-22 and Table B-35. In portions of this area, roadside ditches and culverts lack volume capacity and are prone to blockages from debris. Streets of primary concern that are monitored during rain events in this area are Sheldon Road, Bradshaw Road, Grant Line Road, Waterman Road, Bader Road, Bond Road, and Elk Grove Boulevard.

During heavy rainfall, the major streets west of Highway 99 experience localized flooding due to inlets being blocked with leaves resulting in standing water on one or more lanes in the roadway. Major streets of primary concern that are monitored during rain events in this area are Big Horn Boulevard, Laguna Boulevard, Bruceville Road, Elk Grove Boulevard, and Franklin Boulevard.

Figure B-22 and Table B-35 identifies known and past occurrences of such areas and the associated problems encountered. This list is an initial inventory of key problem areas and is not intended to be a complete inventory of all problems and locations associated with severe weather events and localized flooding in the City.

Figure B-22 Potential Localized Flooding Locations



Source: City of Elk Grove GIS.

*Table B-35 City of Elk Grove’s Road List of Localized Flooding Problem Areas*

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Big Horn Blvd. at Bruceville Rd.	X					X	
Laguna Blvd. between Harbour Point Dr. and Laguna Springs Dr.	X			X		X	X
Laguna Main areas – Renwick Ave., Vaux Ave., Benedix Way	X					X	X
Elk Grove Blvd. between Harbour Point Dr. and Laguna Springs Dr.	X			X		X	X
Kammerer Rd. at Bruceville Rd.	X	X		X		X	
Valley Oak Ln.	X					X	X
Entire “Old Town” Area	X					X	X
Waterman Rd. in the vicinity of Kent St.	X			X		X	
Bond Rd. at Bradshaw Rd.	X					X	
Sheldon Rd.	X					X	
Sheldon Rd. at Bader Rd.	X					X	X
Scenic Elk Ct. and St. Anthony’s Ct. s/o Sheldon Rd.	X					X	
Springhurst Dr. north of N. Camden Dr.	X					X	
Major Roads west of Hwy. 99	X					X	X
Roadside Ditches East Elk Grove Area/ Rural area	X					X	X

Source: City of Elk Grove

### Past Occurrences

The City noted that localized flooding is an annual occurrence and affects those areas described above.

### Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the City and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

The City has not experienced any large flooding events since incorporation, although smaller localized flooding events occur annually. Localized flooding occurs primarily during the winter and spring months, with areas of concern largely near waterways and creek systems that swell during heavy rainfall events. Roadway flooding has also occurred in specific locations during heavy rainfall events due to inadequate drainage or blockages of the drainage system. With expected increases in average annual precipitation as a result of climate change, the City is expecting to see increased rainfall during larger storm events. This could place increased stress on stormwater drainage systems.

### **Future Development**

Future development in the City will use Low Impact Development (LID) techniques and infiltration best management practices (BMPs) such as infiltration trenches, infiltration basins, bio retention planters, porous pavement, dry wells and green streets. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwater. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized flooding. Mitigating the causes of the localized stormwater flooding will reduce future risks of losses.

### ***Levee Failure***

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—High

### **Hazard Profile and Problem Description**

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main channel of a stream. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

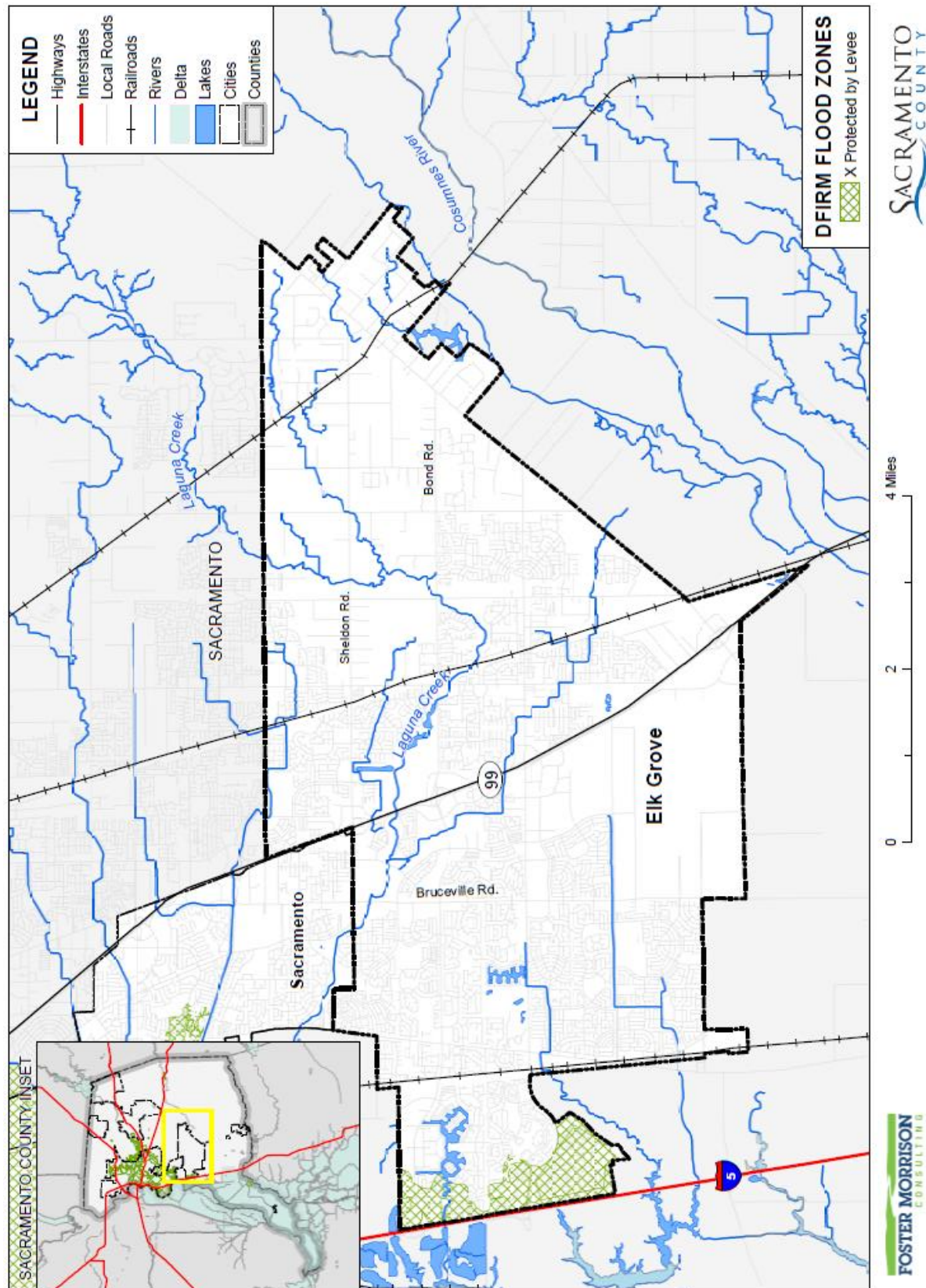
## Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the City are not known. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. The HMPC noted that when northern California reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees.

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

The Elk Grove area is protected by a number of project levees that are part of federally authorized flood projects and are considered part of the State Plan of Flood Control. There are no project levees in Elk Grove, but several project levees located outside of the City affect flooding in the City along the Sacramento River. A number of non-project levees also provide flood protection to the community. These non-project levees were generally constructed prior to project levees and without federal or State assistance. They are not part of the State Plan of Flood Control. Non-project levees are located along the eastern side of Interstate 5 and along Morrison Creek, Laguna Creek, and the Cosumnes River. Figure B-23 shows the FEMA DFIRM X Protected by Levee areas in the City. Geographical levee failure flood extent for the City from the FEMA DFIRMs is shown in Table B-36.

Figure B-23 City of Elk Grove – DFIRM X Protected by Levee Areas



*Table B-36 City of Elk Grove – Geographical Levee Failure Extents*

X Protected by Levee/ Jurisdiction	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Elk Grove	1,966	5.64%	1,774	6.81%	192	2.18%

Source: FEMA DFIRM 7/19/2018

\*Percentage of total acres is the percent of total acres of the entire County Planning Area, not the total acres of the jurisdiction

### Past Occurrences

There have been two state and two federal disaster declaration from levee failure. This can be seen in Table B-37.

*Table B-37 Sacramento County – State and Federal Levee Failure Disaster Declarations 1950-2020*

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Levee Break	2	1972, 1980	2	1972, 1980

Source: Cal OES, FEMA

There have been no past occurrences of levee failure in the City.

### Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach. Generally, levees fail due to overtopping or collapse. A catastrophic levee failure resulting from collapse can occur very quickly with relatively little warning. Such a failure could occur where a levee is saturated and the high hydrostatic water pressure on the river side, coupled with erosion of the levee from high water flows or an inherent defect in the levee, causes an almost instant collapse of a portion of the levee. Under such circumstances, structures located relatively near the break will suffer immediate and extensive damage. Several hundred yards away from the break the energy of the flood waters will be dispersed sufficiently to reduce, but not eliminate, flooding damage to structures in its path. The flood water will flow in a relatively shallow path toward any low point in the affected area. Flood water will collect in these low areas and the levels will rise as the flow continues. When the rivers are high, it is not possible to close or repair a levee break until the water surface in the river and the flooded area equalize.

The City of Elk Grove 2019 General Plan noted that the existing levee system in areas surrounding Elk Grove was initially constructed by hand labor, and later by dredging to hold back river floods and tidal influences, to obtain additional lands for grazing and crop growing. Constant maintenance is necessary to hold these levees against the river floods that threaten surrounding areas. Because levees are vulnerable to peat oxidation as well as sand, silt, and peat erosion, new material is continually added to maintain them. Subsiding farmlands adjacent to levees may increase water pressure against the levees, adding to the

potential for levee failure. In addition, many levees, known as non-project levees, are not maintained to any specified standard, which can increase the likelihood of failure and inundation.

The City’s levee system is designed to protect the Laguna West communities from the backwater effects of the Cosumnes and Mokelumne Rivers. These levees have never experienced flood waters on the water side of the levees. If a 100-year flood event should occur, backwater effects from the Cosumnes and Mokelumne Rivers are expected to last for only one (1) to two (2) days as the Cosumnes River is an uncontrolled watershed and the peak flows from the river will last for a short period of time.

A major overtopping of a levee may result in severe erosion of the levee crowns on the landward side and cause levee failure over a period of minutes to several hours. A severe levee overtopping can, therefore, be considered as a levee break for the purpose of determining the extent of flooding that any area will suffer. Generally, overtopping can be predicted based on river stages and the warning given depending on the source of the flood waters. On the Sacramento River system, depending on which dams are releasing the flows, advance warning of river stages may be as much as 24 hours.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

**Assets at Risk**

Based on the vulnerability of Elk Grove to the levee failure hazard, the sections that follow describes significant assets at risk in the City of Elk Grove. This section includes the values at risk, population at risk, and critical facilities at risk.

*Values at Risk*

GIS was used to determine the possible impacts of levee failure flooding within the City of Elk Grove. The methodology described in Section 4.3.14 of the Base Plan was followed in determining structures and values at risk to the levee failure flooding. Table B-38 shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA X Protected by Levee flood zones in the City.

*Table B-38 City of Elk Grove – Count and Values of Parcels at Risk in X Protected by Levee Flood Zone and Property Use*

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
<b>X Protected by Levee</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0
Care/Health	1	1	\$745,000	\$1,735,000	\$1,735,000	\$4,215,000

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Church/Welfare	4	4	\$4,115,302	\$15,770,564	\$15,770,564	\$35,656,430
Industrial	6	3	\$9,383,367	\$20,127,566	\$30,191,348	\$59,702,281
Miscellaneous	60	0	\$584	\$0	\$0	\$584
Office	51	44	\$14,324,891	\$93,962,948	\$93,962,948	\$202,250,787
Public/Utilities	0	0	\$0	\$0	\$0	\$0
Recreational	1	1	\$520,200	\$1,500,000	\$1,500,000	\$3,520,200
Residential	2,584	2,567	\$269,922,489	\$852,199,179	\$426,099,611	\$1,548,221,248
Retail/Commercial	34	32	\$23,045,949	\$40,740,435	\$40,740,435	\$104,526,819
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	23	0	\$17,877,606	\$0	\$0	\$17,877,606
<b>X Protected by Levee Total</b>	<b>2,764</b>	<b>2,652</b>	<b>\$339,935,388</b>	<b>\$1,026,035,692</b>	<b>\$609,999,906</b>	<b>\$1,975,970,955</b>

Source: FEMA 11/2/2018 DFIRM, Sacramento County 2020 Parcel/Assessor's Data

\*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

\*\*This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table B-39 shows City of Elk Grove levee failure flood loss estimates and improved values at risk by FEMA X Protected by Levee flood zones.

*Table B-39 City of Elk Grove – X Protected by Levee Flood Loss Estimates*

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
X Protected by Levee	4,257	4,085	\$1,222,120,847	\$705,971,312	\$1,928,092,159	\$385,618,432	0.21%

Source: FEMA 11/2/2018 DFIRM, Sacramento County 2020 Parcel/Assessor's Data

\*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

\*\*This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table B-39, the City of Elk Grove has 4,085 parcels and \$1.93 billion of structure and contents values or values in the X Protected by Levee flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, two feet of flooding would cause \$385 million in flood damages in the City.

Structures protected by levees that fail are often total losses. The analysis above assumes all levees in the City break at one time, which is unlikely. The extent and depth of actual flooding and associated damage will vary depending on the location, nature, depth, and extent of any levee break.

### *Population at Risk*

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the levee failure flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Elk Grove – 3.20. According to this analysis, there is a total population of 813 residents of the City at risk to levee failure flooding. This is shown in Table B-31.

*Table B-40 City of Elk Grove – Count of Improved Residential Parcels and Population by Flood Zone*

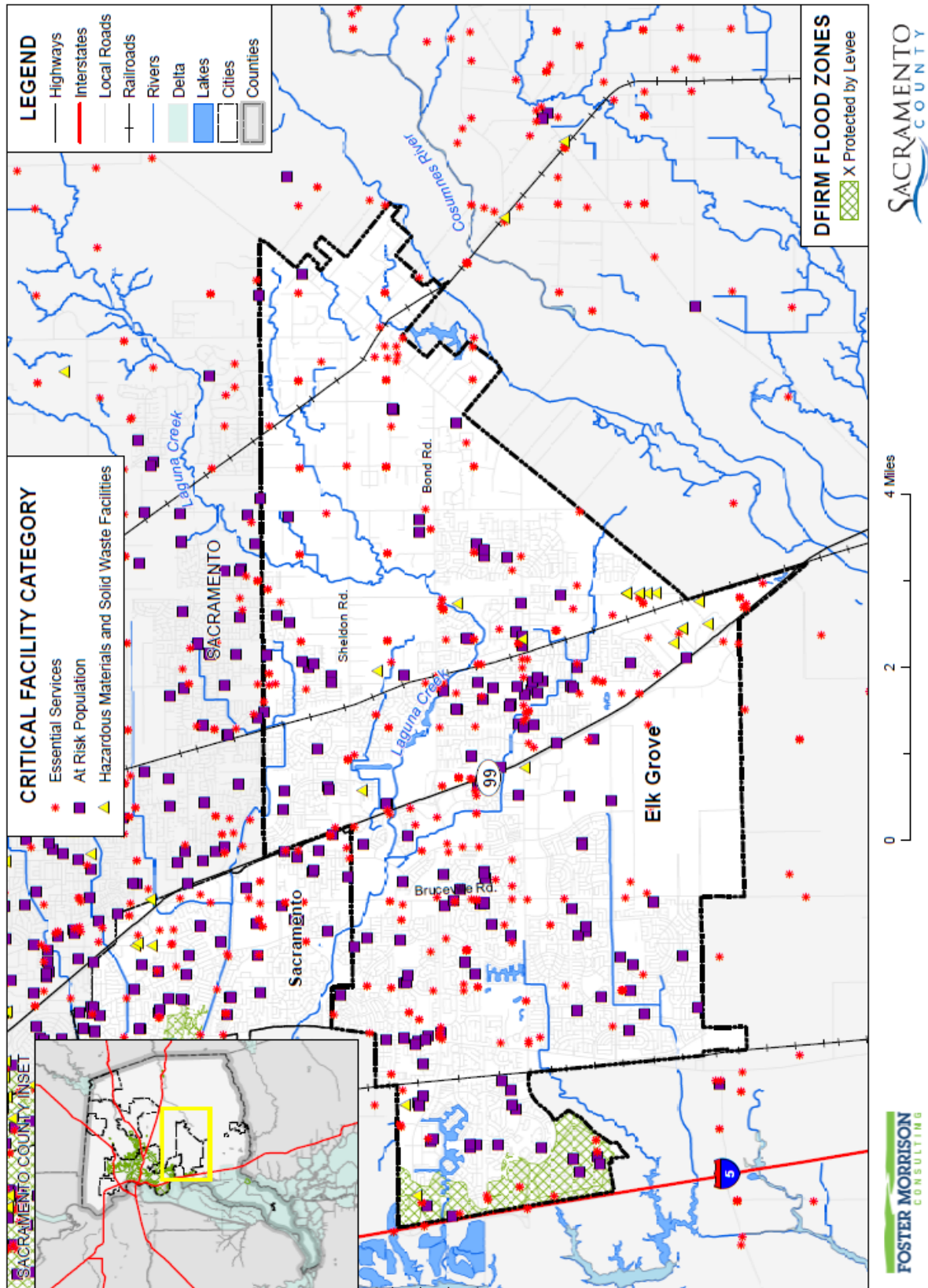
Jurisdiction	X Protected by Levee	
	Improved Residential Parcels	Population at Risk
Elk Grove	2,567	8,214

Source: FEMA DFIRM 11/2/2018, Sacramento County 2020 Parcel/Assessor's Data, US Census Bureau

### *Critical Facilities at Risk*

An analysis was performed on the critical facility inventory in Elk Grove in identified DFIRM X Protected by Levee flood zones. GIS was used to determine whether the critical facility locations intersect a DFIRM flood zones and if so, which zone it intersects. Details of critical facilities in mapped dam inundation areas in the City of Elk Groves are shown in Figure B-24 and detailed in Table B-41. Details of critical facility definition, type, name and address and jurisdiction by DFIRM X Protected by Levee flood zones are listed in Appendix F.

Figure B-24 City of Elk Grove – Critical Facilities in X Protected by Levee Flood Zones



*Table B-41 City of Elk Grove – Critical Facilities in DFIRM X Protected by Levee Flood Zones by Category and Type*

Flood Zone Critical Facility Category	Critical Facility Type	Facility Count
<b>0.2% Annual Chance Flood Hazard – X Protected by Levee</b>		
Essential Services Facilities	Emergency Evacuation Center	1
	EMS Stations	1
	FDIC Insured Banks	5
	Fire Station	1
	Microwave Service Towers	7
	Water Well	12
	<b>Total</b>	<b>27</b>
At Risk Population Facilities	Day Care Center	3
	Places of Worship	1
	School	4
	<b>Total</b>	<b>8</b>
Hazardous Materials and Solid Waste Facilities	–	–
	<b>Total</b>	<b>0</b>
<b>X Protected by Levee Flood Hazard Total</b>		<b>35</b>

Source: City of Elk Grove, FEMA 7/19/2018 DFIRM

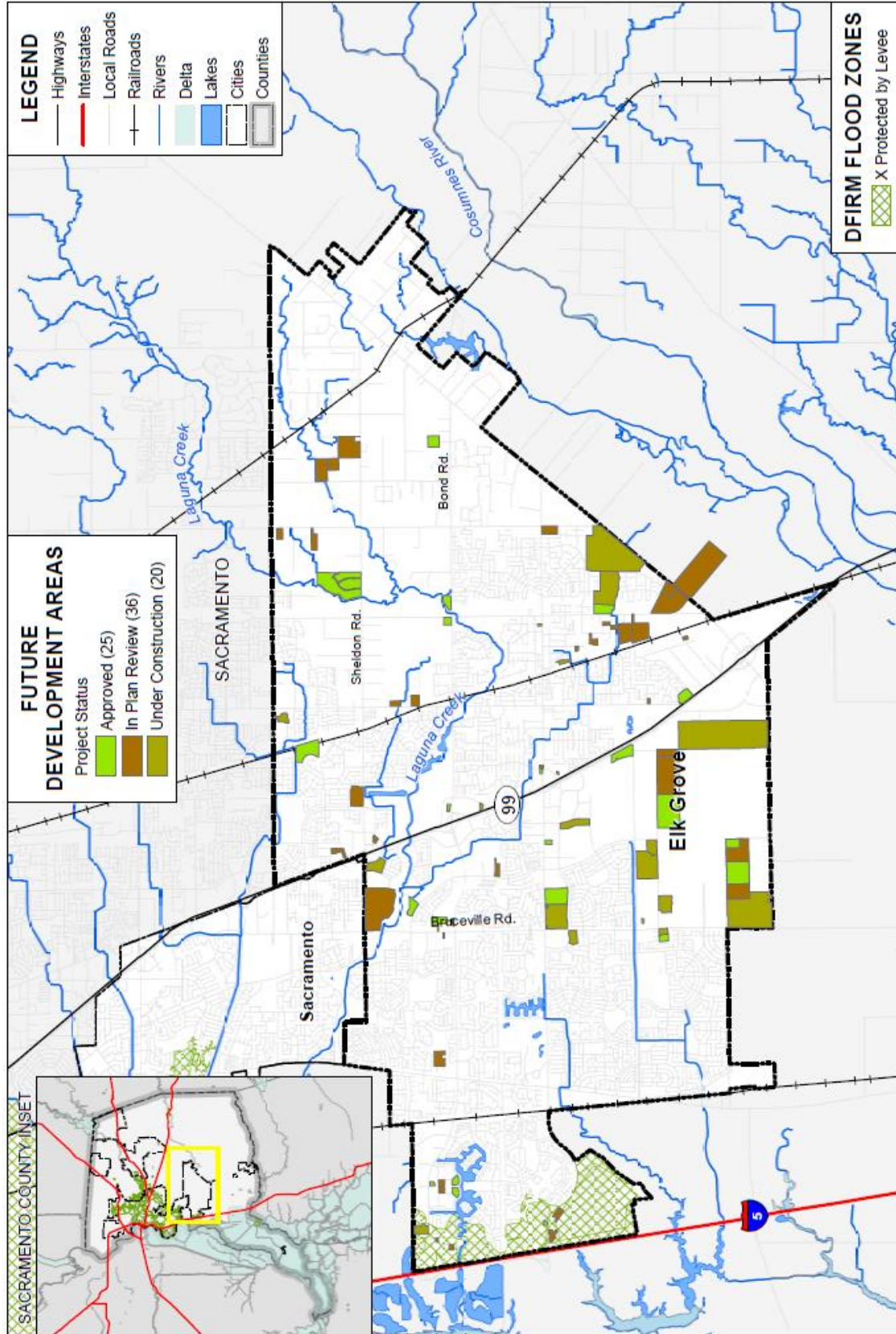
**Future Development**

The City’s levee system is located in the Laguna West/Stonelake communities. These communities are built-out and only infill projects are anticipated to occur in these areas. Any future development will be required to meet the City’s development standards, policies and ordinances.

*GIS Analysis*

The City provided future development areas were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-25 shows the locations of future development areas the City is planning to develop on the DFIRM X Protected by Levee layer. Table B-42 shows the parcels and acreages of each future development area in the City in the X Protected by Levee areas.

*Figure B-25 City of Elk Grove – DFIRM X Protected by Levee Zones and Future Development*



Data Source: FEMA NFHL 07/19/2018, Sacramento County GIS, Cal-Atlas; Map Date: 05/2021.

*Table B-42 City of Elk Grove – DFIRM X Protected by Levee Flood Zones and Future Development Areas*

Flood Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>X Protected by Levee</b>			
<b>Approved</b>			
Arco AM/PM Car Wash Expansion	1	1	1.2
<b>Approved Total</b>	<b>1</b>	<b>1</b>	<b>1.2</b>
<b>In Plan Review</b>			
California Northstate University Medical Center	6	5	5.3
Candlewood Hotel	1	0	1.9
Elk Grove Independent Senior Housing	2	0	5.2
Wendy's Remodel	1	1	0.8
<b>In Plan Review Total</b>	<b>10</b>	<b>6</b>	<b>13.1</b>
<b>Under Construction</b>			
Cafeteria Expansion	1	1	9.2
<b>Under Construction Total</b>	<b>1</b>	<b>1</b>	<b>9.2</b>
<b>X Protected by Levee Total</b>	<b>12</b>	<b>8</b>	<b>23.5</b>

Source: City of Elk Grove GIS, FEMA 7/19/2018 DFIRM

***Pandemic***

**Likelihood of Future Occurrence**–Likely  
**Vulnerability**–Medium

**Hazard Profile and Problem Description**

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity. A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe a pandemic could lead to high levels of illness, death, social disruption, and economic loss.

**Location and Extent**

During a pandemic, the whole of the City, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no

scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

### Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table B-43.

*Table B-43 Sacramento County – State and Federal Pandemic Disaster Declarations 1950-2020*

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**
- **2019/2020 COVID 19**

With the COVID-19 pandemic, the city saw major shutdowns as a result of the State stay-at-home order and County public health orders. Non-essential businesses were closed for various periods or were required to operate at limited capacity. Many businesses implemented employee COVID-19 testing measures. The unemployment rate for the City went from 4.0% before the pandemic to 12.7% in June 2020. The hospitality industry was particularly impacted by the pandemic. Occupancy rates declined by as much as 60% from the previous year in April 2020, with the negative rates lasting through March 2021. The overall occupancy rate for 2020 was down by 15% from the previous year. In addition, local schools were closed or on distance learning only operations from on March 7, 2020, to March 30, 2021.

### Vulnerability to and Impacts from Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. A pandemic does not affect the buildings, critical facilities, and infrastructure in the City. A pandemic can have varying levels of impact to the citizens of the City and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) and unemployment rose significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards.

There were numerous impacts to the City from the COVID-19 pandemic, including related to City finances and transit services.

City finances were significantly impacted. In March 2020, to help mitigate the impacts of the anticipated \$7 million revenue decrease in projected General Fund revenues for fiscal year 2020-21, staff made efforts to implement reductions to the fiscal year 2020-21 budget. This included adding no new staff positions for proposed fiscal year 2020-21. Also not included in the fiscal year 2020-21 budget was an advance prepayment of the City's PERS unfunded accrued liabilities (UAL) in the amount of \$915 thousand. Sales tax assumptions and forecasts a \$4.7 million decline in sales for fiscal year 2020-2021 resulting from the pandemic.

In terms of transit services, following Sacramento County's stay-at-home order that was issued in mid-March 2020 the City's fixed-route transit service (e-tran) and Americans with Disabilities Act (ADA) paratransit service (e-van) immediately experienced a significant loss in transit demand and ridership. Additionally, the pandemic negatively impacted the staff personnel available to operate the City's transit services. Both of these factors led the City to temporarily reduce the daily scheduled e-tran commuter route trips by 50%. The e-tran local route services were not reduced in order to continue providing the necessary coverage within the City's jurisdictional boundaries and immediate service area for essential employment and lifeline service needs. The e-van service, which provides on demand, saw lower ridership and demand during the pandemic.

### **Future Development**

Future development is not expected to be significantly impacted by this hazard, though population growth in the City could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the City. If the median age of City residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

### ***Severe Weather: Extreme Cold and Freeze***

**Likelihood of Future Occurrence**—Likely

**Vulnerability**—Medium

### **Hazard Profile and Problem Description**

According to the National Weather Service), extreme cold often accompanies a winter storm or is left in its wake. Freezing temperatures can also occur without the accompanying winter storm.

## Location and Extent

Extreme cold and freeze are regional issues, meaning the entire City is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of extreme cold and freeze, temperature data from the County from the WRCC indicates minimum temperatures fall below 32°F on 8.3 days with no days falling below 0°F. Freeze has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time.

## Past Occurrences

There has been no federal or state disaster declarations in the County for extreme cold and freeze. The City noted that cold and freeze is a regional phenomenon; events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.3.3.

## Vulnerability to and Impacts from Severe Weather: Extreme Cold and Freeze

The City experiences temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations. Freeze can cause injury or in extreme situations, loss of life to residents of the City. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold.

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. When extreme cold is coupled with high winds or ice storms, power lines may be downed, resulting in an interruption of utilities and critical services. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the City. The elderly and young population is most vulnerable to temperature extremes. The residents of nursing homes and elder care facilities, as well as transient and homeless populations are especially vulnerable to extreme cold events.

## Future Development

Future development built to code should be able to withstand issues associated with extreme cold and freeze events. Pipes at risk of freezing should be buried or insulated from freeze as new facilities are improved or added. Vulnerability to extreme cold will increase as the average age of the population in the County shifts and homelessness becomes more of an issue.

Ultra-efficient homes are being incorporated into the community with state-of-the-art energy-efficient construction, appliances, and lighting with commercially available renewable energy systems, such as solar water heating and solar electricity. Energy saving and water-wise drought tolerant landscapes are also being incorporated into future landscape development.

## *Severe Weather: Extreme Heat*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to power outages and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the City. However, PSPS events in the City have been declining with PG&E’s refined system for shutting power off in high wildfire risk areas.

### **Location and Extent**

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat event determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

### **Past Occurrences**

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.3.3.

There have been no previous reported heat-related damages, injuries or deaths.

## Vulnerability to and Impacts from Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-115°F in rather extreme situations. During these times, drought conditions may worsen and the City may see an increase in dry fuels. Also, power outages and PSPS events may occur during these times as well. Health issues are the primary concern with this hazard, although economic impacts can also be an issue.

The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. This is especially true of homeless people and the transient population.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

The City opens “Cooling centers” during the occasional periods of extreme heat. In the past, the cooling centers were opened an average of 5 times per year and have had very low attendance. Churches and schools can be opened in the event there is a need to expand the cooling centers throughout the City. If long term or widespread heat conditions continue, County Emergency Operation Services would declare a local emergency or the possibility of a state emergency would be activated. Those being served at the City cooling centers could be transferred to larger Red Cross centers opened within the County.

Expected increases in extreme heat, with average annual temperatures increasing in addition to the duration and frequency of heat wave events, are a concern for the City. These conditions are intensified due to urban heat island effects. Of paramount concern is resident health and wellbeing during heat related events, particularly vulnerable populations. In addition, impacts on infrastructure due to extreme heat is also a concern.

### Future Development

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population in each City shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary.

Ultra-efficient homes are being incorporated into the community with state-of-the-art energy-efficient construction, appliances, and lighting with commercially available renewable energy systems, such as solar water heating and solar electricity. Energy saving and water-wise drought tolerant landscapes are also being incorporated into future landscape development.

## *Severe Weather: Heavy Rains and Storms*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

### Hazard Profile and Problem Description

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

### Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rare in the City and Sacramento County. Duration of severe storms in California, Sacramento County, and the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

### Past Occurrences

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This is the cause of many of the federal disaster declarations related to flooding. Heavy rains and storms occur during the winter and spring months causing occasional localized street flooding. The flooding section above includes information on impacts from past events.

### Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are an annual occurrence in the City. These events can cause significant and localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Power outages may also occur. Heavy rains and storms often result in flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

There have been heavy rain or storm events effecting the City within the past few years, usually resulting in localized flooding. These have occurred primarily during the winter and spring months, with areas of concern largely near waterways and creek systems that swell during heavy rainfall events. Roadway flooding has also occurred in specific locations during heavy rainfall events due to inadequate drainage or blockages of the drainage system. With climate change, the City is expected to see increased average annual precipitation which is largely anticipated to happen during heavy rainfall events. This could place increased stress on stormwater drainage systems.

### Future Development

The City has a Storm Drainage Master Plan, which identifies improvements necessary as part of new development to address storm and flood risk. Additionally, the City has adopted General Plan policy discouraging fill in floodplains and has adopted new flood damage prevention regulations in its Municipal Code. Future development in the City is subject to these requirements. New critical facilities should be built to withstand hail damage, lightning, and heavy rains.

### *Wildfire*

**Likelihood of Future Occurrence**—Highly Likely

**Vulnerability**—High

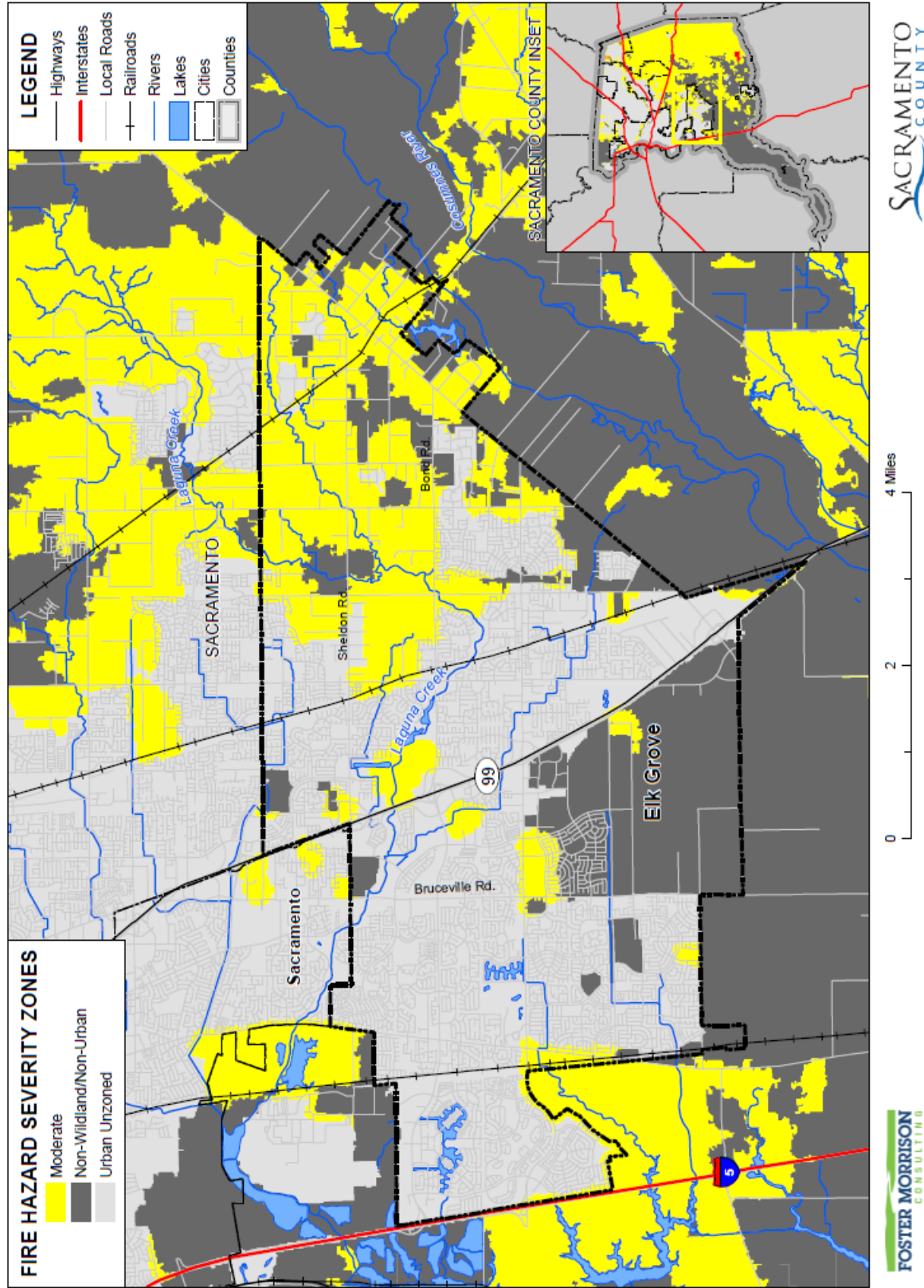
### Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Elk Grove. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

### Location and Extent

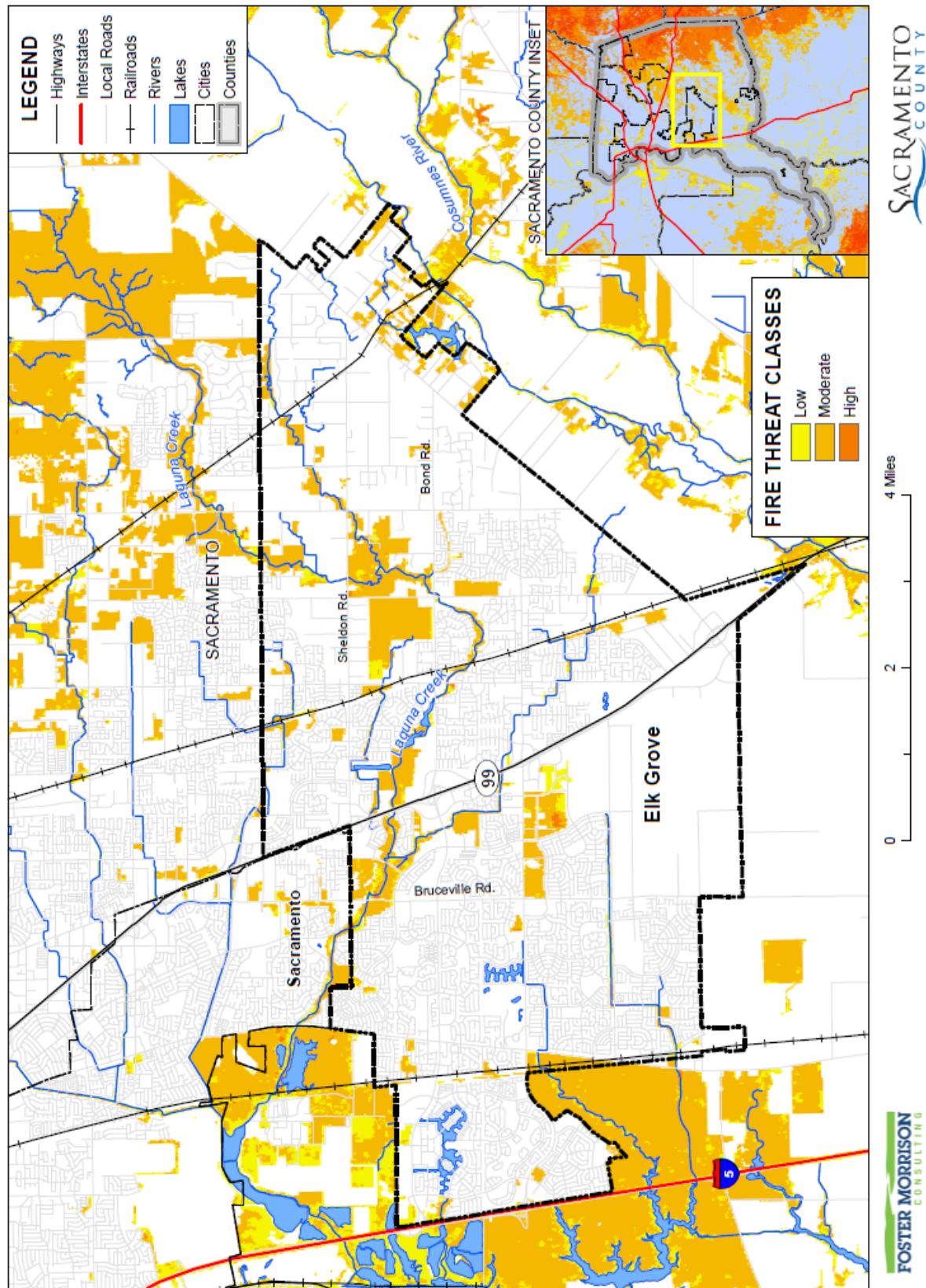
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the City of Elk Grove were created. Figure B-26 shows the CAL FIRE Hazard Severity Zones (FHSZs) in the City. As shown on the maps, FHSZs within the City range from urban unzoned to moderate. Figure B-27 shows the CAL FIRE Threat Areas in the City. As shown on the maps, fire threat within the City ranges from low to moderate.

Figure B-26 City of Elk Grove – Fire Hazard Severity Zones



Data Source: Cal-Fire 2017 (Draft 9/2007 - c34fhfsl06\_1, Adopted 11/2007 - fhfsl06\_3\_34, Recommended 10/2008 - c34fhfsl06\_3), Sacramento County GIS, Cal-Atlas; Map Date: 09/2020.

Figure B-27 City of Elk Grove – Fire Threat Areas



Data Source: Cal-Fire 2017 Fire Threat Data (fthr14\_2), Sacramento County GIS, Cal-Atlas; Map Date: 09/2020.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table B-44. Geographical Fire Threat Area extents from CAL FIRE are shown on Table B-45.

*Table B-44 City of Elk Grove – Geographical FHSZ Extents*

Fire Hazard Severity Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Very High	0	0.00%	0	0.00%	0	0.00%
High	0	0.00%	0	0.00%	0	0.00%
Moderate	6,421.2	24.18%	4,424.6	23.29%	1,996.6	26.41%
Non-Wildland/non-Urban	5,208.0	19.61%	2,532.8	13.33%	2,675.2	35.39%
Urban Unzoned	14,926.6	56.21%	12,038.6	63.37%	2,888.1	38.20%
<b>Total</b>	<b>26,555.9</b>	<b>100.00%</b>	<b>18,996.0</b>	<b>100.00%</b>	<b>7,559.9</b>	<b>100.00%</b>

Source: CAL FIRE

*Table B-45 City of Elk Grove – Geographical Fire Threat Area Extents*

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0.00%	0	0.00%	0	0.00%
High	18.3	0.07%	1.3	0.01%	17.0	0.23%
Moderate	2,201.0	8.29%	574.9	3.03%	1,626.0	21.51%
Low	408.8	1.54%	126.7	0.67%	282.1	3.73%
No Threat	23,927.8	90.10%	18,293.1	96.30%	5,634.7	74.53%
<b>Total</b>	<b>26,555.9</b>	<b>100.00%</b>	<b>18,996.0</b>	<b>100.00%</b>	<b>7,559.9</b>	<b>100.00%</b>

Source: CAL FIRE

### Past Occurrences

There has been no state and one federal disaster declaration due to fire, as shown in Table B-46. It should be noted that this fire disaster was from an explosion in Roseville, and not from an actual wildfire.

*Table B-46 Sacramento County – State and Federal Wildfire Disaster Declarations 1950-2020*

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	1	1973	0	–

Source: Cal OES, FEMA

The City Planning Team noted that occasionally, open field brush fires have occurred in the City:

- A 25-acre fire that occurred on June 9 of 2015. A grass fire that started about 1:30 p.m. at Bond and Waterman roads was driven by high, shifting winds. It quickly spread toward homes that border the field to the east and south. The fire damaged one Elk Grove home and prompted evacuation of several other residences before it was contained.
- On June 6, 2016, a small grass fire broke out in an Elk Grove residential area. The fire was first reported near Sundance Lane and Auberry Drive in an empty grass field. Though no injuries were reported, the half-acre blaze did damage a backyard fence and some gardening equipment.
- On July 12, 2016, a grass fire burned 10 acres at a vacant lot that bordered a neighborhood, a shopping center, and an elementary school. No injuries, deaths, or building damages were reported. This fire occurred around 12:45 p.m. near Dandelion Drive in north Elk Grove.

No major fires have occurred since the City was incorporated. The police department provided mutual aid resources for several large fires in California from 2016 to present. The Cosumnes Fire Department also provided staff through strike team deployments during this period. These events included:

- Cascade Fire, Yuba County (CA), October 2017. Elk Grove Police Department sent police officers to assist with evacuation area security as mutual aid.
- Tubbs Fire, Sonoma County (CA), October 2017. Elk Grove Police Department sent police officers for evacuations and evacuation area security, tactical dispatchers for field deployments, and tactical dispatchers who provided Public Safety Answering Point mutual aid.
- Atlas Fire, Napa and Solano Counties (CA), November 2017. Elk Grove Police Department sent public safety dispatchers who provided Public Safety Answering Point mutual aid.
- Camp Fire, Butte County (CA), November 2018. Elk Grove Police Department sent police officers for evacuations and evacuation area security, tactical dispatchers for immediate field command post setup and incident command consulting, animal control officers for field deployments, and provided logistical assistance in coordinating Public Safety Dispatcher mutual aid for several months.
- Kincade Fire, Sonoma County (CA), November 2019. Elk Grove Police Department sent police officers for evacuations and evacuation area security, and tactical dispatchers for Public Safety Answering Point mutual aid.
- Moccasin Fire, Tuolumne County (CA), August 2020. Elk Grove Police Department sent police officers for evacuation area security as mutual aid.
- Lake Napa Unit (LNU) Lightning Complex Fires, Lake and Napa Counties (CA), August 2020. Elk Grove Police Department sent police officers for evacuations and evacuation area security as mutual aid.
- North Complex Fire, Plumas and Butte Counties (CA), September 2020. Elk Grove Police Department sent police officers for evacuation area security as mutual aid.
- Thomas Fire, Santa Barbara (CA), 2017, Cosumnes Fire Department sent firefighters to assist with the extinguishment of the fire as mutual aid.
- Carr Fire, Shasta County (CA), 2018, Cosumnes Fire Department sent firefighters to assist with the extinguishment of the fire as mutual aid.
- Mendocino Fire, Colusa County, (CA), 2018, Cosumnes Fire Department sent firefighters to assist with extinguishment of the fire as mutual aid.
- Glass Fire, Santa Clara (CA), 2020, Cosumnes Fire Department sent firefighters to assist with the extinguishment of the fire as mutual aid.
- Creek Fire, Fresno County, (CA), 2020, Cosumnes Fire Department sent firefighters to assist with the extinguishment of the fire as mutual aid.

The eight Police Department mutual aid events listed above resulted in a total cost of \$262,567.86 to the City of Elk Grove, with \$178,886.98 being reimbursed. The Cosumnes Fire Department (CFD) receives almost 100% reimbursement from the state for strike team deployments, of which there were five during the period. The impact to CFD staff during the summer months due to these deployments are largely physical and mental fatigue. Throughout Camp Fire, Kincade Fire, and LNU Lightning Complex Fire, air quality was affected by smoke within the City and Police Department buildings, including within the 9-1-1 dispatch center. Over multiple weeks during these events the general public was instructed to remain indoors due to poor air quality.

## Vulnerability to and Impacts from Wildfire

Fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and City, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Elk Grove is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels. There are several eucalyptus groves that exist in the Wilton area, at the south-east boundary with the City, that could pose a significant fire threat.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic

wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The largest impact from fires in the City would be poor air quality.

### Assets at Risk

Based on the vulnerability of Elk Grove to the wildfire hazard, the sections that follow describes significant assets at risk in the City of Elk Grove. This section includes the values at risk, population at risk, and critical facilities at risk.

### Values at Risk in Fire Hazard Severity Zones

GIS was used to determine the possible impacts of wildfire within the City of Elk Grove. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Elk Grove are shown in Table B-47, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone. Table B-48 breaks out the Table B-47 by adding the property use details by fire hazard severity zone for the City.

*Table B-47 City of Elk Grove – Count and Value of Parcels by Fire Hazard Severity Zone*

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Moderate	4,626	4,096	\$706,051,086	\$1,660,424,981	\$1,009,598,054	\$3,376,074,109
Non-Wildland/Non-Urban	5,579	4,199	\$824,296,197	\$1,706,112,600	\$931,174,201	\$3,461,583,045
Urban Unzoned	45,379	43,514	\$4,732,164,010	\$12,988,437,567	\$7,499,238,222	\$25,219,839,740
<b>Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: Sacramento County 2020 Parcel/Assessor's Data, CAL FIRE

*Table B-48 City of Elk Grove – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use*

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
<b>Moderate</b>						
Agricultural	4	2	\$342,002	\$81,932	\$81,932	\$505,866
Care/Health	7	3	\$5,907,909	\$10,620,008	\$10,620,008	\$27,147,925
Church/Welfare	13	12	\$8,633,553	\$46,514,661	\$46,514,661	\$101,662,875
Industrial	8	6	\$5,440,287	\$1,802,168	\$2,703,253	\$9,945,707
Miscellaneous	191	0	\$462,407	\$0	\$0	\$462,407

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Office	20	17	\$15,499,494	\$131,196,332	\$131,196,332	\$277,892,158
Public/Utilities	17	0	\$54	\$0	\$0	\$54
Recreational	2	2	\$3,479,933	\$13,940,482	\$13,940,482	\$31,360,897
Residential	4,041	3,991	\$516,222,244	\$1,298,636,452	\$649,318,235	\$2,464,176,920
Retail / Commercial	64	48	\$62,108,660	\$155,223,151	\$155,223,151	\$372,554,962
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	259	15	\$87,954,543	\$2,409,795	\$0	\$90,364,338
<b>Moderate Total</b>	<b>4,626</b>	<b>4,096</b>	<b>\$706,051,086</b>	<b>\$1,660,424,981</b>	<b>\$1,009,598,054</b>	<b>\$3,376,074,109</b>
<b>Non-Wildland/Non-Urban</b>						
Agricultural	14	5	\$1,034,336	\$1,157,380	\$1,157,380	\$3,349,096
Care/Health	1	0	\$0	\$0	\$0	\$0
Church/Welfare	0	0	\$0	\$0	\$0	\$0
Industrial	1	0	\$10	\$0	\$0	\$10
Miscellaneous	251	0	\$323,953	\$0	\$0	\$323,953
Office	1	1	\$2,767,116	\$27,162,130	\$27,162,130	\$57,091,376
Public/Utilities	7	0	\$9	\$0	\$0	\$9
Recreational	3	0	\$27	\$0	\$0	\$27
Residential	4,181	4,144	\$490,808,073	\$1,537,341,350	\$768,670,663	\$2,796,820,133
Retail / Commercial	26	25	\$56,502,262	\$134,184,028	\$134,184,028	\$324,870,318
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	1,094	24	\$272,860,411	\$6,267,712	\$0	\$279,128,123
<b>Non-Wildland/Non-Urban Total</b>	<b>5,579</b>	<b>4,199</b>	<b>\$824,296,197</b>	<b>\$1,706,112,600</b>	<b>\$931,174,201</b>	<b>\$3,461,583,045</b>
<b>Urban Unzoned</b>						
Agricultural	1	0	\$9	\$0	\$0	\$9
Care/Health	28	24	\$32,032,149	\$142,344,099	\$142,344,099	\$316,720,347
Church/Welfare	38	35	\$23,993,953	\$84,569,665	\$84,569,665	\$193,133,283
Industrial	197	169	\$94,985,848	\$327,809,631	\$491,714,438	\$914,509,929
Miscellaneous	1,146	1	\$579,504	\$1,100	\$1,100	\$581,704
Office	305	278	\$82,883,620	\$372,875,747	\$372,875,747	\$828,635,114
Public/Utilities	48	0	\$47	\$0	\$0	\$47
Recreational	15	14	\$10,341,358	\$41,034,359	\$41,034,359	\$92,410,076
Residential	42,786	42,644	\$4,105,644,216	\$11,298,654,499	\$5,649,327,372	\$21,053,626,016

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Retail / Commercial	343	327	\$270,744,417	\$717,371,442	\$717,371,442	\$1,705,487,301
Unknown	1	1	\$0	\$127,600	\$0	\$127,600
Vacant	471	21	\$110,958,889	\$3,649,425	\$0	\$114,608,314
<b>Urban Unzoned Total</b>	<b>45,379</b>	<b>43,514</b>	<b>\$4,732,164,010</b>	<b>\$12,988,437,567</b>	<b>\$7,499,238,222</b>	<b>\$25,219,839,740</b>
<b>Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: Sacramento County 2020 Parcel/Assessor's Data, CAL FIRE

### Values at Risk in Fire Threat Areas

GIS was used to determine the possible impacts of wildfire within the City of Elk Grove. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire threat areas. Summary analysis results for Elk Grove are shown in Table B-49, which summarizes total parcel counts, improved parcel counts and their structure values by fire threat area. Table B-50 breaks out the Table B-49 by adding the property use details by threat areas for the City.

*Table B-49 City of Elk Grove – Count and Value of Parcels by Fire Threat Area*

Fire Threat Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High	0	0	\$0	\$0	\$0	\$0
High	3	1	\$64,995	\$154,762	\$77,381	\$297,138
Moderate	552	275	\$164,149,216	\$255,300,118	\$194,070,862	\$613,520,201
Low	192	113	\$38,024,306	\$74,113,140	\$55,684,179	\$167,821,621
No Threat	54,837	51,420	\$6,060,272,776	\$16,025,407,128	\$9,190,178,055	\$31,275,857,934
<b>Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: Sacramento County 2020 Parcel/Assessor's Data, CAL FIRE

*Table B-50 City of Elk Grove – Count and Value of Parcels by Fire Threat Area and Property Use*

Fire Threat Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
<b>High</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0
Care/Health	0	0	\$0	\$0	\$0	\$0
Church/Welfare	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0

Fire Threat Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Miscellaneous	2	0	\$10	\$0	\$0	\$10
Office	0	0	\$0	\$0	\$0	\$0
Public/Utilities	0	0	\$0	\$0	\$0	\$0
Recreational	0	0	\$0	\$0	\$0	\$0
Residential	1	1	\$64,985	\$154,762	\$77,381	\$297,128
Retail/Commercial	0	0	\$0	\$0	\$0	\$0
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	0	0	\$0	\$0	\$0	\$0
<b>High Total</b>	<b>3</b>	<b>1</b>	<b>\$64,995</b>	<b>\$154,762</b>	<b>\$77,381</b>	<b>\$297,138</b>
<b>Moderate</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0
Care/Health	6	1	\$10,587,857	\$19,884,890	\$19,884,890	\$50,357,637
Church/Welfare	1	0	\$29	\$0	\$0	\$29
Industrial	0	0	\$0	\$0	\$0	\$0
Miscellaneous	105	0	\$152,914	\$0	\$0	\$152,914
Office	4	4	\$1,849,968	\$81,946,711	\$81,946,711	\$165,743,390
Public/Utilities	7	0	\$0	\$0	\$0	\$0
Recreational	0	0	\$0	\$0	\$0	\$0
Residential	271	260	\$40,081,105	\$121,758,517	\$60,879,261	\$222,718,888
Retail/Commercial	23	9	\$25,752,605	\$31,360,000	\$31,360,000	\$88,472,605
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	135	1	\$85,724,738	\$350,000	\$0	\$86,074,738
<b>Moderate Total</b>	<b>552</b>	<b>275</b>	<b>\$164,149,216</b>	<b>\$255,300,118</b>	<b>\$194,070,862</b>	<b>\$613,520,201</b>
<b>Low</b>						
Agricultural	0	0	\$0	\$0	\$0	\$0
Care/Health	1	1	\$2,863,080	\$5,652,593	\$5,652,593	\$14,168,266
Church/Welfare	1	1	\$568,160	\$4,054,589	\$4,054,589	\$8,677,338
Industrial	2	2	\$496,453	\$471,525	\$707,288	\$1,675,266
Miscellaneous	44	0	\$388	\$0	\$0	\$388
Office	5	4	\$2,672,416	\$8,994,543	\$8,994,543	\$20,661,502
Public/Utilities	2	0	\$0	\$0	\$0	\$0
Recreational	0	0	\$0	\$0	\$0	\$0
Residential	99	99	\$12,691,537	\$36,043,454	\$18,021,730	\$66,756,717
Retail/Commercial	4	4	\$3,233,690	\$18,253,436	\$18,253,436	\$39,740,562

Fire Threat Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Unknown	0	0	\$0	\$0	\$0	\$0
Vacant	34	2	\$15,498,582	\$643,000	\$0	\$16,141,582
<b>Low Total</b>	<b>192</b>	<b>113</b>	<b>\$38,024,306</b>	<b>\$74,113,140</b>	<b>\$55,684,179</b>	<b>\$167,821,621</b>
<b>No Threat</b>						
Agricultural	19	7	\$1,376,347	\$1,239,312	\$1,239,312	\$3,854,971
Care/Health	29	25	\$24,489,121	\$127,426,624	\$127,426,624	\$279,342,369
Church/Welfare	49	46	\$32,059,317	\$127,029,737	\$127,029,737	\$286,118,791
Industrial	204	173	\$99,929,692	\$329,140,274	\$493,710,403	\$922,780,380
Miscellaneous	1,437	1	\$1,212,552	\$1,100	\$1,100	\$1,214,752
Office	317	288	\$96,627,846	\$440,292,955	\$440,292,955	\$977,213,756
Public/Utilities	63	0	\$110	\$0	\$0	\$110
Recreational	20	16	\$13,821,318	\$54,974,841	\$54,974,841	\$123,771,000
Residential	50,637	50,419	\$5,059,836,906	\$13,976,675,568	\$6,988,337,898	\$26,024,850,336
Retail/Commercial	406	387	\$360,369,044	\$957,165,185	\$957,165,185	\$2,274,699,414
Unknown	1	1	\$0	\$127,600	\$0	\$127,600
Vacant	1,655	57	\$370,550,523	\$11,333,932	\$0	\$381,884,455
<b>No Threat Total</b>	<b>54,837</b>	<b>51,420</b>	<b>\$6,060,272,776</b>	<b>\$16,025,407,128</b>	<b>\$9,190,178,055</b>	<b>\$31,275,857,934</b>
<b>Elk Grove Total</b>	<b>55,584</b>	<b>51,809</b>	<b>\$6,262,511,293</b>	<b>\$16,354,975,148</b>	<b>\$9,440,010,477</b>	<b>\$32,057,496,894</b>

Source: Sacramento County 2020 Parcel/Assessor's Data, CAL FIRE

### Population at Risk

The FHSZ and Fire Threat dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the FHSZs and Fire Threat Areas were counted and multiplied by the 2010 Census Bureau average household factors for the City of Elk Grove – 3.20. According to this analysis, there is a total population of 12,771 residents of Elk Grove at risk to moderate or higher FHSZs, while there is a total of 833 in the moderate or higher fire threat areas. This is shown in Table B-51 and Table B-52, respectively.

**Table B-51 City of Elk Grove – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone**

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Elk Grove	0	0	0	0	3,991	12,771

Source: CAL FIRE, US Census Bureau Average Household Sizes: Citrus Heights (2.54); Sacramento City (2.66); Elk Grove (3.20); Folsom (2.63), Galt (3.16); Isleton (2.7), Rancho Cordova (2.14); and unincorporated Sacramento County (2.76)

*Table B-52 City of Elk Grove – Count of Improved Residential Parcels and Population by Fire Threat Area*

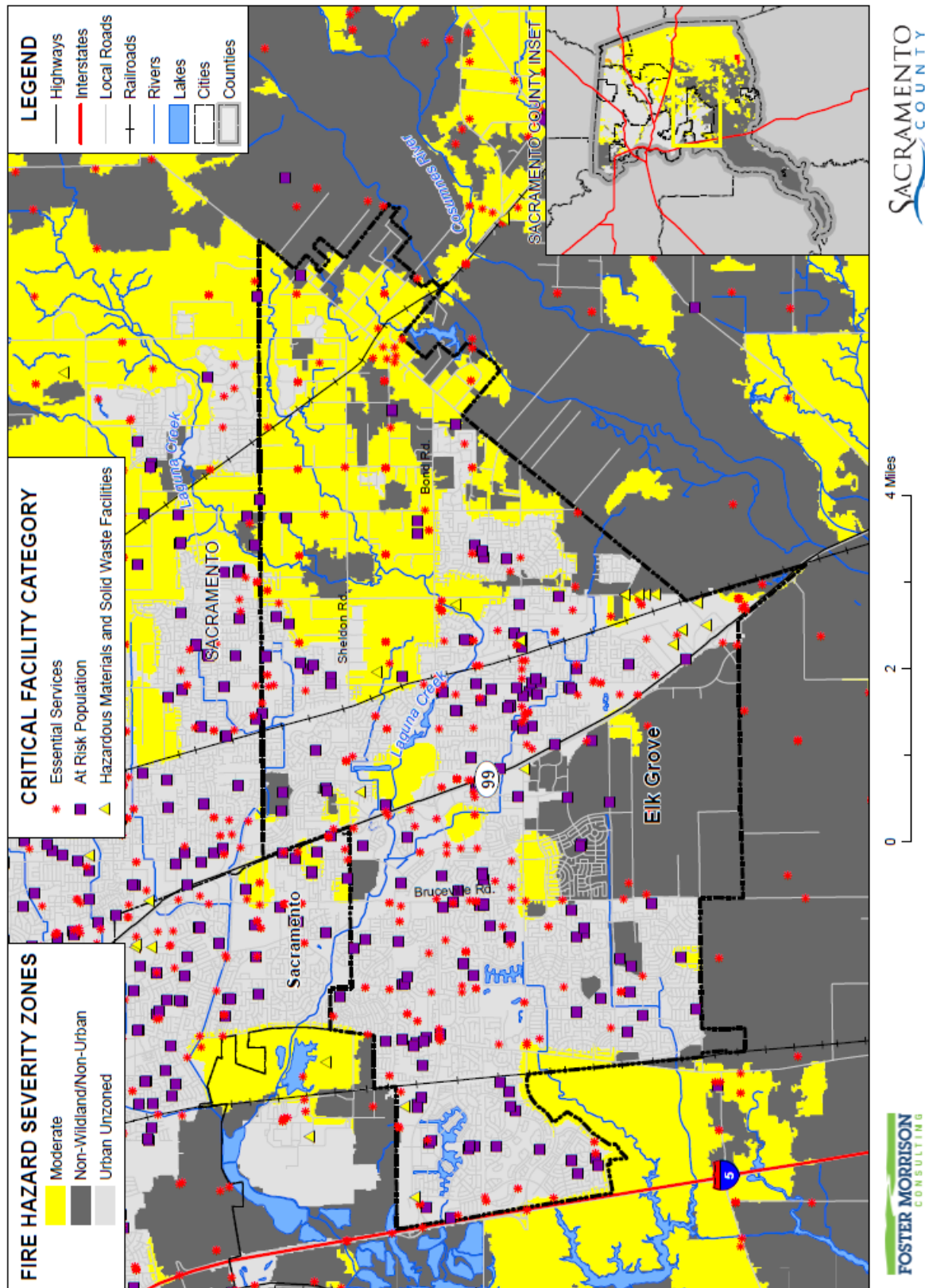
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Elk Grove	0	0	1	3	260	832

Source: CAL FIRE, US Census Bureau Average Household Sizes

***Critical Facilities at Risk***

An analysis was performed on the critical facility inventory in Elk Grove in identified FHSZs. Critical facilities in a FHSZ in the City of Elk Grove are shown in Figure B-28 and detailed in Table B-53. Critical facilities in a fire threat area in the City of Elk Grove are shown in Figure B-29 and detailed in Table B-54. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure B-28 City of Elk Grove – Critical Facilities in Fire Hazard Severity Zones



Data Source: Cal-Fire 2017 (Draft 9/2007 - c34fhfz/06\_1, Adopted 11/2007 - fhfz06\_3\_34, Recommended 10/2008 - c34fhfz/06\_3), Sacramento County GIS, Cal-Atlas, Map Date: 08/2021.

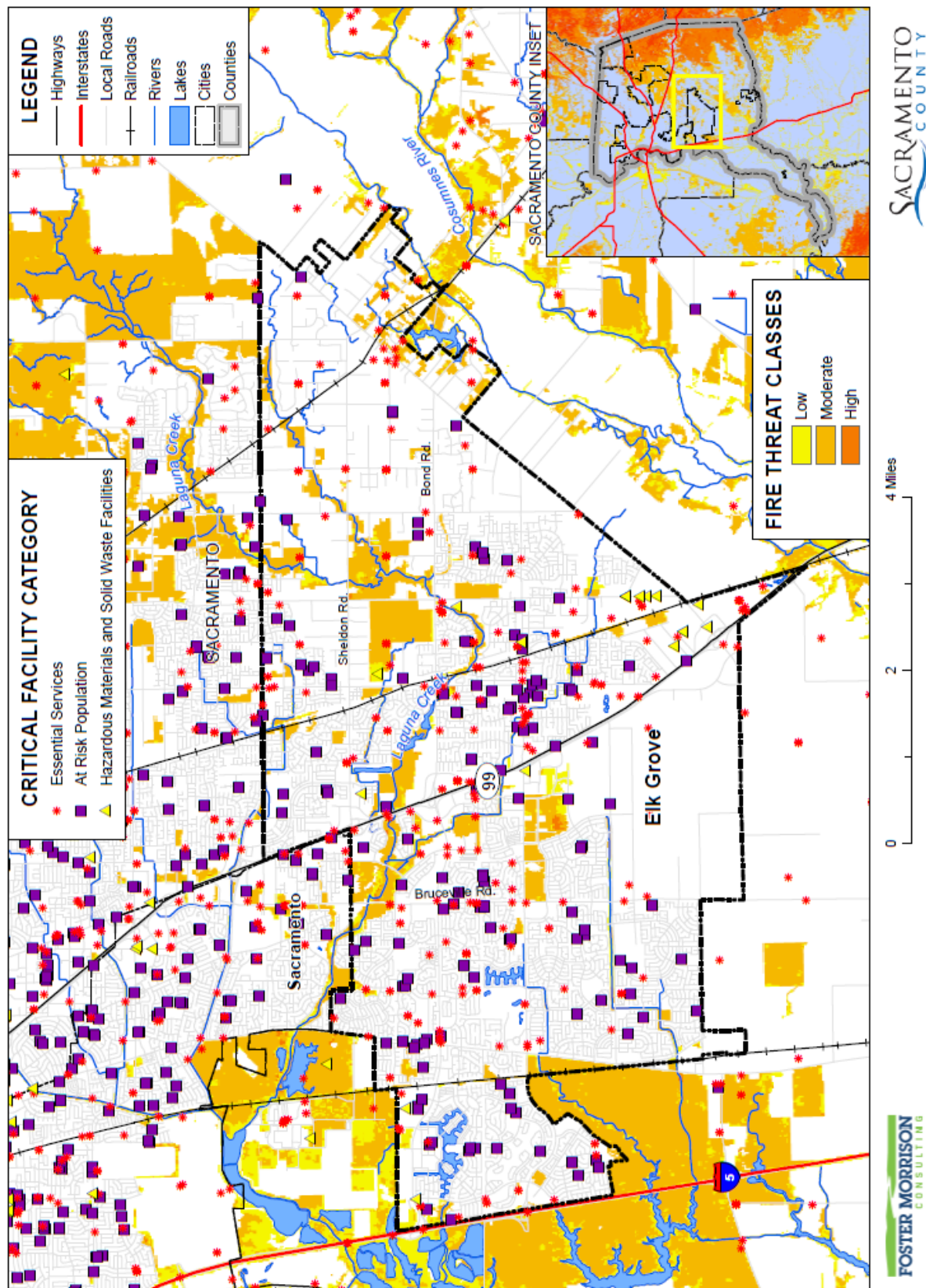
*Table B-53 City of Elk Grove – Critical Facilities in Fire Hazard Severity Zones by Category and Type*

Fire Hazard Severity Zone/Critical Facility Category	Critical Facility Type	Facility Count
<b>Moderate</b>		
Essential Services Facilities	Cellular Tower	2
	EMS Stations	1
	FDIC Insured Banks	4
	Fire Station	1
	Microwave Service Towers	13
	Water Well	61
	<b>Total</b>	<b>82</b>
At Risk Population Facilities	Day Care Center	2
	Places of Worship	1
	School	5
	<b>Total</b>	<b>8</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	2
	EPA ER TSCA Facility	2
	Solid Waste Facility	2
	<b>Total</b>	<b>6</b>
<b>Moderate Total</b>		<b>96</b>
<b>Non-Wildland/Non-Urban</b>		
Essential Services Facilities	Water Well	17
	<b>Total</b>	<b>17</b>
At Risk Population Facilities	Day Care Center	4
	Places of Worship	2
	School	9
	<b>Total</b>	<b>15</b>
<b>Non-Wildland/Non-Urban Total</b>		<b>32</b>
<b>Urban Unzoned</b>		
Essential Services Facilities	Emergency Evacuation Center	8
	EMS Stations	6
	FDIC Insured Banks	22
	Fire Station	5
	Hospital or Urgent Care	1
	Law Enforcement	2
	Microwave Service Towers	94
	Sewage Treatment Plant	1

Fire Hazard Severity Zone/Critical Facility Category	Critical Facility Type	Facility Count
	Water Well	80
	<b>Total</b>	<b>219</b>
At Risk Population Facilities	Day Care Center	30
	Mobile Home Parks	1
	Places of Worship	86
	School	31
	<b>Total</b>	<b>148</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	4
	EPA ER TSCA Facility	1
	Leaky Underground Storage Tank	4
	Solid Waste Facility	2
	Waste Transfer Station	1
	<b>Total</b>	<b>12</b>
<b>Urban Unzoned Total</b>		<b>379</b>
<b>Elk Grove Total</b>		<b>507</b>

Source: CAL FIRE, Sacramento County

Figure B-29 City of Elk Grove – Critical Facilities in Fire Threat Areas



Data Source: Cal-Fire 2017 Fire Threat Data (fthr14\_2), Sacramento County GIS, Cal-Atlas, Map Date: 08/2021.

*Table B-54 City of Elk Grove – Critical Facilities in Fire Threat Areas by Category and Type*

Fire Threat/ Critical Facility Category	Critical Facility Type	Facility Count
<b>Low</b>		
Essential Services Facilities	Microwave Service Towers	2
	Water Well	1
	<b>Total</b>	<b>3</b>
Hazardous Materials and Solid Waste Facilities	Solid Waste Facility	1
	<b>Total</b>	<b>1</b>
<b>Low Total</b>		<b>4</b>
<b>Moderate</b>		
Essential Services Facilities	Water Well	24
	<b>Total</b>	<b>24</b>
At Risk Population Facilities	School	1
	<b>Total</b>	<b>1</b>
<b>Moderate Total</b>		<b>25</b>
<b>No Threat</b>		
Essential Services Facilities	Cellular Tower	2
	Emergency Evacuation Center	8
	EMS Stations	7
	FDIC Insured Banks	26
	Fire Station	6
	Hospital or Urgent Care	1
	Law Enforcement	2
	Microwave Service Towers	105
	Sewage Treatment Plant	1
	Water Well	133
	<b>Total</b>	<b>291</b>
At Risk Population Facilities	Day Care Center	36
	Mobile Home Parks	1
	Places of Worship	89
	School	44
	<b>Total</b>	<b>170</b>
Hazardous Materials and Solid Waste Facilities	EPA ER TRI Facility	6
	EPA ER TSCA Facility	3
	Leaky Underground Storage Tank	4
	Solid Waste Facility	3
	Waste Transfer Station	1
	<b>Total</b>	<b>17</b>

Fire Threat/ Critical Facility Category	Critical Facility Type	Facility Count
<b>No Threat Total</b>		<b>478</b>
<b>Elk Grove Total</b>		<b>507</b>

Source: CAL FIRE, Sacramento County

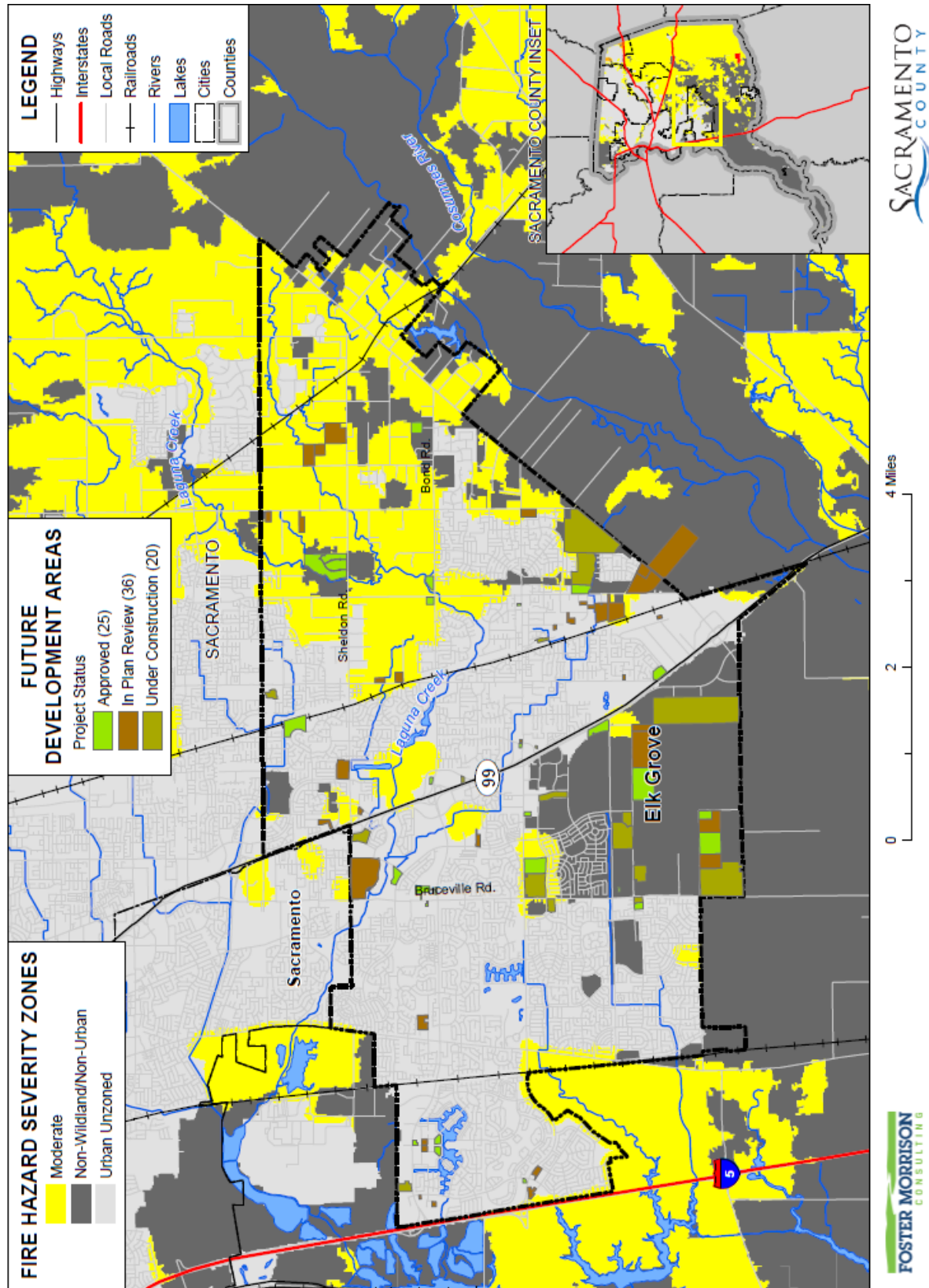
## Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk. While there is additional growth and development within the City, none of this is in a moderate or high fire zone

### *GIS Analysis*

The City provided future development areas were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-30 shows the locations of future development areas the City is planning to develop on the FHSZs. Table B-55 shows the parcels and acreages of each future development area in the City in each FHSZ. Figure B-31 shows the locations of future development areas the City is planning to develop on the Fire Threat Area. Table B-56 shows the parcels and acreages of each future development area in the City in each Fire Threat Area.

Figure B-30 City of Elk Grove – FHSZs and Future Development Areas



Data Source: Cal-Fire 2017 (Draft 9/2007 - c34fhfz06\_1, Adopted 11/2007 - fhfz06\_3\_34, Recommended 10/2008 - c34fhfz06\_3), Sacramento County GIS, Cal-Atlas; Map Date: 05/2021.

*Table B-55 City of Elk Grove – FHSZs and Future Development Areas*

Fire Hazard Severity Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>Moderate</b>			
<b>Approved</b>			
Buffalo Wild Wings	1	0	1.0
Creekside Estates	1	0	7.0
Dignity Health Medical Campus	7	1	28.0
Sheldon Park Estates North Gated Community	1	1	1.8
Shell with 7-Eleven & Storage Facility	4	0	4.5
<b>Approved Total</b>	<b>14</b>	<b>2</b>	<b>42.4</b>
<b>In Plan Review</b>			
10075 Sheldon Road Tentative Parcel Map	1	1	35.3
8580 Bradshaw Road	1	0	8.3
8633 Bader Road Map	1	1	20.3
8651 Bader Road TPM and Rezone	1	1	10.0
Eden Gardens Banquet Hall	1	1	5.2
Elk Grove Muslim Center	2	1	6.9
In-N-Out Burger - The Ridge Pad 14	1	0	0.9
S&J Storage	1	0	4.3
<b>In Plan Review Total</b>	<b>9</b>	<b>5</b>	<b>91.3</b>
<b>Under Construction</b>			
Bruceville Point	1	1	4.8
Fieldstone North and South	1	0	0.2
The Ridge Shopping Center	20	8	39.6
Under Construction Total	22	9	44.7
<b>Moderate Total</b>	<b>45</b>	<b>16</b>	<b>178.4</b>
<b>Non-Wildland/Non-Urban</b>			
<b>Approved</b>			
Bond Road Rezone and Tentative Map	2	2	10.1
Crooked Creek Industrial Park	2	1	14.2
New Faze Skilled Nursing	1	0	15.1
Poppy Keys Southwest	3	0	60.2
Seasons at Stonebrook Master Home Plan	3	0	79.5
Sheldon Park Estates North Gated Community	27	8	70.0
Vineyard at Madeira Pad E	1	0	0.7
<b>Approved Total</b>	<b>39</b>	<b>11</b>	<b>250.0</b>
<b>In Plan Review</b>			

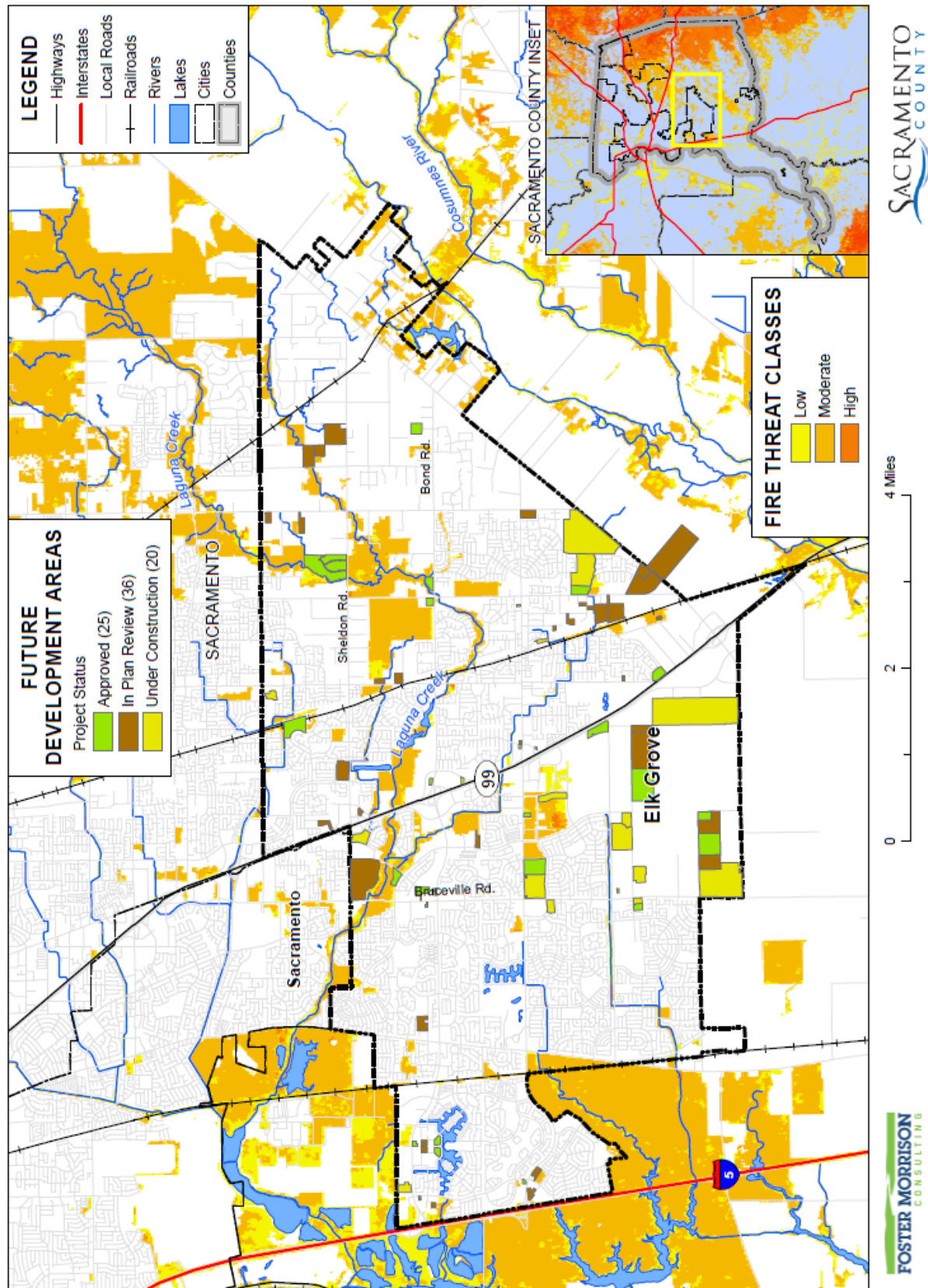
Fire Hazard Severity Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
Grant Line Construction Aggregate Production and Recycling Facility	1	0	24.8
Kubota Tractor Corporation	1	1	101.6
Mendes Villages 2 & 3	1	0	30.6
Mountain Elk Villas	1	0	12.1
Poppy Keys Southeast	4	0	66.5
Sheldon Farms MHP	2	0	80.9
Telos Greens TSM and Rezone	1	0	26.4
Tractor Supply Company	1	0	67.4
Triangle Point TSM Phase 2	1	0	67.4
<b>In Plan Review Total</b>	<b>13</b>	<b>1</b>	<b>477.8</b>
<b>Under Construction</b>			
Bruceville Meadows Residential	253	0	96.5
Fieldstone North and South	513	234	113.4
Fortune School	2	0	40.0
Madeira South (Poppy Lane)	221	92	35.1
Madeira South Lot A Master House Plans	1	0	10.6
McGeary Ranch	84	3	13.3
Mendes Subdivision	1	0	39.5
Milestone	126	29	45.5
Sheldon Farms North	1	0	43.8
Sterling Meadows	623	444	172.2
<b>Under Construction Total</b>	<b>1,825</b>	<b>802</b>	<b>609.8</b>
<b>Non-Wildland/Non-Urban Total</b>	<b>1,877</b>	<b>814</b>	<b>1,337.5</b>
<b>Urban Unzoned</b>			
<b>Approved</b>			
AAA Services Building	1	0	0.7
Arco AM/PM Car Wash Expansion	1	1	1.2
Elk Grove Masonic Lodge	1	0	0.7
GreenSpace Self Storage Facility	1	0	3.0
Laguna West Plaza Pads 1 & 2	2	0	1.6
Quail Run II	1	0	4.8
Raising Cane's Restaurant	1	1	1.7
Shell Gas Station	1	0	1.0
Target Exterior Remodel	1	1	10.1
T-Mobile Evergreen Springs	1	1	2.3
T-Mobile Jones Family Park	1	0	26.7

Fire Hazard Severity Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
Toscano Apartments	2	0	7.9
Trojan Storage II	1	0	8.9
U-Haul	4	0	10.2
<b>Approved Total</b>	<b>19</b>	<b>4</b>	<b>80.8</b>
<b>In Plan Review</b>			
10069 Elk Grove Florin Road TPM	1	1	1.1
9730 Kent Street Addition	1	0	1.3
Bartholomew Vineyard Amendment	1	1	10.3
Bow Stockton Apartments	2	1	5.6
Burger King Remodel	1	1	0.7
California Northstate University Medical Center	6	5	5.3
Candlewood Hotel	1	0	1.9
Elk Grove Food Bank	1	1	2.0
Elk Grove Independent Senior Housing	2	0	5.2
Hotel at Sheldon Place	1	0	2.3
Laguna Main Street Apartments	4	0	5.8
Laguna Springs Corporate Center - Building A	1	0	4.9
Life Storage Expansion	1	0	4.6
Sheldon Grove Subdivision	1	0	19.8
Tegan Estates	3	3	11.9
Warda Warehouse 3	1	0	1.5
Waterman Brinkman Logistics Center	3	1	21.6
Wendy's Remodel	1	1	0.8
In Plan Review Total	32	15	106.4
<b>Under Construction</b>			
Bruceville Point	1	0	3.5
Cafeteria Expansion	1	1	9.2
Calvine Pointe	1	0	7.1
Railroad Street	4	1	3.2
Sheldon Terrace	204	74	14.3
The Gardens at Quail Run	1	0	4.4
The Park Senior Housing	3	0	15.1
Towneplace Suites	1	1	1.7
Wienerschnitzel	1	0	0.4
<b>Under Construction Total</b>	<b>217</b>	<b>77</b>	<b>59.0</b>
<b>Urban Unzoned Total</b>	<b>268</b>	<b>96</b>	<b>246.2</b>

Fire Hazard Severity Zone / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>Grand Total</b>	<b>2,190</b>	<b>926</b>	<b>1,762.1</b>

Source: City of Elk Grove GIS, CAL FIRE

Figure B-31 City of Elk Grove – Fire Threat Areas and Future Development Areas



Data Source: Cal-Fire 2017 Fire Threat Data (fthrt14\_2), Sacramento County GIS, Cal-Atlas; Map Date: 05/2021.

*Table B-56 City of Elk Grove – Fire Threat Areas and Future Development Areas*

Fire Threat / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
<b>Moderate</b>			
<b>Approved</b>			
Buffalo Wild Wings	1	0	1.0
Creekside Estates	1	0	7.0
Dignity Health Medical Campus	3	0	21.5
T-Mobile Jones Family Park	1	0	26.7
Trojan Storage II	1	0	8.9
<b>Approved Total</b>	<b>7</b>	<b>0</b>	<b>65.1</b>
<b>In Plan Review</b>			
8651 Bader Road TPM and Rezone	1	1	10.0
Candlewood Hotel	1	0	1.9
Elk Grove Independent Senior Housing	2	0	5.2
In-N-Out Burger - The Ridge Pad 14	1	0	0.9
Laguna Springs Corporate Center - Building A	1	0	4.9
Sheldon Farms MHP	2	0	80.9
Warda Warehouse 3	1	0	1.5
<b>In Plan Review Total</b>	<b>9</b>	<b>1</b>	<b>105.3</b>
<b>Under Construction</b>			
Milestone	1	0	4.5
Sheldon Farms North	1	0	43.8
The Park Senior Housing	2	0	11.4
The Ridge Shopping Center	20	8	39.6
<b>Under Construction Total</b>	<b>24</b>	<b>8</b>	<b>99.3</b>
<b>Moderate Total</b>	<b>40</b>	<b>9</b>	<b>269.6</b>
<b>Low</b>			
<b>Under Construction</b>			
Milestone	7	1	2.7
The Park Senior Housing	1	0	3.8
<b>Under Construction Total</b>	<b>8</b>	<b>1</b>	<b>6.5</b>
<b>Low Total</b>	<b>8</b>	<b>1</b>	<b>6.5</b>
<b>No Threat</b>			
<b>Approved</b>			
AAA Services Building	1	0	0.7
Arco AM/PM Car Wash Expansion	1	1	1.2
Bond Road Rezone and Tentative Map	2	2	10.1

Fire Threat / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
Crooked Creek Industrial Park	2	1	14.2
Dignity Health Medical Campus	4	1	6.5
Elk Grove Masonic Lodge	1	0	0.7
GreenSpace Self Storage Facility	1	0	3.0
Laguna West Plaza Pads 1 & 2	2	0	1.6
New Faze Skilled Nursing	1	0	15.1
Poppy Keys Southwest	3	0	60.2
Quail Run II	1	0	4.8
Raising Cane's Restaurant	1	1	1.7
Seasons at Stonebrook Master Home Plan	3	0	79.5
Sheldon Park Estates North Gated Community	28	9	71.9
Shell Gas Station	1	0	1.0
Shell with 7-Eleven & Storage Facility	4	0	4.5
Target Exterior Remodel	1	1	10.1
T-Mobile Evergreen Springs	1	1	2.3
Toscana Apartments	2	0	7.9
U-Haul	4	0	10.2
Vineyard at Madeira Pad E	1		0.7
<b>Approved Total</b>	<b>65</b>	<b>17</b>	<b>308.1</b>
<b>In Plan Review</b>			
10069 Elk Grove Florin Road TPM	1	1	1.1
10075 Sheldon Road Tentative Parcel Map	1	1	35.3
8580 Bradshaw Road	1	0	8.3
8633 Bader Road Map	1	1	20.3
9730 Kent Street Addition	1	0	1.3
Bartholomew Vineyard Amendment	1	1	10.3
Bow Stockton Apartments	2	1	5.6
Burger King Remodel	1	1	0.7
California Northstate University Medical Center	6	5	5.3
Eden Gardens Banquet Hall	1	1	5.2
Elk Grove Food Bank	1	1	2.0
Elk Grove Muslim Center	2	1	6.9
Grant Line Construction Aggregate Production and Recycling Facility	1	0	24.8
Hotel at Sheldon Place	1	0	2.3
Kubota Tractor Corporation	1	1	101.6
Laguna Main Street Apartments	4	0	5.8

Fire Threat / Future Development Status / Title	Total Parcel Count	Improved Parcel Count	Total Acres
Life Storage Expansion	1	0	4.6
Mendes Villages 2 & 3	1	0	30.6
Mountain Elk Villas	1	0	12.1
Poppy Keys Southeast	4	0	66.5
S&J Storage	1	0	4.3
Sheldon Grove Subdivision	1	0	19.8
Tegan Estates	3	3	11.9
Telos Greens TSM and Rezone	1	0	26.4
Tractor Supply Company	1	0	67.4
Triangle Point TSM Phase 2	1	0	67.4
Waterman Brinkman Logistics Center	3	1	21.6
Wendy's Remodel	1	1	0.8
<b>In Plan Review Total</b>	<b>45</b>	<b>20</b>	<b>570.2</b>
<b>Under Construction</b>			
Bruceville Meadows Residential	253	0	96.5
Bruceville Point	2	1	8.3
Cafeteria Expansion	1	1	9.2
Calvine Pointe	1	0	7.1
Fieldstone North and South	514	234	113.6
Fortune School	2	0	40.0
Madeira South (Poppy Lane)	221	92	35.1
Madeira South Lot A Master House Plans	1	0	10.6
McGeary Ranch	84	3	13.3
Mendes Subdivision	1	0	39.5
Milestone	118	28	38.3
Railroad Street	4	1	3.2
Sheldon Terrace	204	74	14.3
Sterling Meadows	623	444	172.2
The Gardens at Quail Run	1	0	4.4
Towneplace Suites	1	1	1.7
Wienerschnitzel	1	0	0.4
<b>Under Construction Total</b>	<b>2,032</b>	<b>879</b>	<b>607.7</b>
<b>No Threat Total</b>	<b>2,142</b>	<b>916</b>	<b>1,486.0</b>
<b>Grand Total</b>	<b>2,190</b>	<b>926</b>	<b>1,762.1</b>

Source: City of Elk Grove GIS, CAL FIRE

## B.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

### B.6.1. Regulatory Mitigation Capabilities

Table B-57 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Elk Grove.

*Table B-57 City of Elk Grove Regulatory Mitigation Capabilities*

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	<p>General Plan The City's General Plan was first adopted in 2003 and was most recently updated in 2019. The Plan as currently adopted identifies a number of safety issues and concerns for the community and includes policies for addressing these issues. Implementation of the policies is deferred to subsequent plans.</p> <p>Storm Drainage Master Plan The City also has a Storm Drainage Master Plan, adopted in 2011 with a minor update completed in 2019, which identifies candidate stormwater drainage projects to address the existing deficiencies and future growth impacts on area drainage. These projects implement the mitigation strategy identified in this LHMP.</p>
Capital Improvements Plan	Y	<p>Capital Improvement Program The Capital Improvement Program is adopted annually by the City Council and identifies capital construction projects to be completed by the City over the coming five years. Many of the projects identified in the plan address potential hazards, such as flooding, heat, and air pollution. The Plan is an excellent approach to implementing mitigation actions.</p> <p>Title 21 Plans/Capital Improvement Program</p>
Economic Development Plan	N	<p>The City Council reviewed the Economic Development Work Plan at its regular meeting on June 22, 2016. Annually, an Economic Development report is presented to City Council. The Work Plan and the annual reports do not address hazards and are not an appropriate location to address mitigation actions.</p>

Local Emergency Operations Plan	Y	The Emergency Operations Plan adopted in 2018 contains a hazard analysis summary and capability assessment. Six products from the capability assessment emerged which were: Participation in County Evacuation Planning, Investment in the Disaster Information Management System (WebEOC), Training and Exercises for Staff, Emergency Operations Center Annex, Recovery Guidance, and Debris removal. The first priority listed in the operational goals section of this plan is to mitigate hazards.
Continuity of Operations Plan	Y	The Emergency Operations Plan adopted in 2018 contains section 2.4 (Continuity of Government (COG) Operations, and 2.5 (Continuity of Operations (COOP). Both sections contain comprehensive information related to COG and COOP to ensure operations are continued during and after a disaster.
Transportation Plan	Y	The City's transportation plan is comprised of the maps and policies in the General Plan, along with other planning documents in the Bicycle, Pedestrian, and Trails, Master Plan, the ADA Transition Plan, and services plans for the City's transit service, e-Tran. Most of these plans do not address hazards as they are focused on the delivery of transportation infrastructure for the movement of goods, services, and people around and through the City. However, as this infrastructure is designed, best planning and engineering practices are applied to ensure that the improvements do not impact drainage ways, increase fire severity, or otherwise create a hazard to persons and property.
Stormwater Management Plan/Program	Y	The City's Storm Drainage Master Plan explains the City's Stormwater Management program, stormwater regulations and it includes flood mitigation projects Chapter 15.12 Stormwater Management and Discharge Control Storm Drainage Master Plan
Engineering Studies for Streams	Y	See Stormwater Management Plan/Program
Community Wildfire Protection Plan	N	The City is not in a wildfire hazard area; therefore no plan is required.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y 2013	The City adopted the most recent Climate Action Plan in 2019 to identify steps the City will take to address climate change. In addition, the City adopted a Community Mobility Resilience Plan in 2021 to provide a comprehensive set of strategies to mitigate and adapt to the impacts of climate change on our transportation network.
<b>Building Code, Permitting, and Inspections</b>	<b>Y/N</b>	<b>Are codes adequately enforced?</b>
Building Code	Y	2016/2019 Yes, codes are enforced by the City's Building Division.
Building Code Effectiveness Grading Schedule (BCEGS) Score	Y	Score: 2
Fire department ISO rating:	Y	Rating: 3/9 (urban/rural)

Site plan review requirements	Y	Since 2005 the City has had a discretionary design review requirement for all new non-residential and multifamily construction over 1,000 square feet. Master home plans (track subdivisions) are also subject to design review.
<b>Is the ordinance an effective measure for reducing hazard impacts?</b>		
<b>Land Use Planning and Ordinances</b>	<b>Y/N</b>	<b>Is the ordinance adequately administered and enforced?</b>
Zoning ordinance	Y 2006	The City's Zoning regulations are included in Title 23 of the Municipal Code. A comprehensive update was completed in 2006. The code is regularly reviewed and updated. Title 23 Zoning
Subdivision ordinance	Y	Title 22 Land Development The City recently adopted Flood Damage Prevention regulations as part of its Municipal Code. The regulations are modeled after the State's model ordinance for non-coastal communities. The regulation will implement policies in the General Plan relative to limiting development in the floodplain.
Floodplain ordinance	Y	The City adopted Chapter 16.50 - Flood Damage Prevention regulations as part of its Municipal Code. The regulations are modeled after the State's model ordinance for non-coastal communities. The regulation implements policies in the General Plan relative to limiting development in the floodplain.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Chapter 15.12 Stormwater Management and Discharge Control Chapter 16.44 Land Grading and Erosion Control Chapter 16.50 Flood Damage Prevention Title 23 Zoning – Division III-Chapter 23.42
Flood insurance rate maps	Y	FEMA, recorded parcel maps and the City's GIS data.
Elevation Certificates	Y	Various sites throughout the City. During review of improvement plans, the Development Engineering team review and approve.
Acquisition of land for open space and public recreation uses	Y	General Plan EGMC 22.40 Bicycle, Pedestrian, and Trail Master Plan Storm Drainage Master Plan Laguna Ridge Specific Plan Southeast Policy Area
Erosion or sediment control program	Y	Chapter 16.44 Land Grading and Erosion Control
Other	Y	Chapter 17.04 Uniform Fire Code was adopted in 2019 which in turn adopts the California Fire Code.
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Continue to implement programs and update/enforce regulations.		

Source: City of Elk Grove

### *City of Elk Grove General Plan (2019)*

The City of Elk Grove General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it

intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the City Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and man-made hazards (such as hazardous materials).

The Services, Health, and Safety chapter contains goals and policies addressing the nine topics listed below, which are each assigned a one-, two-, or three-letter acronym. Within each topic, the following goals further the Community Vision and Supporting Principles. Mitigation-related goals are as follows:

- Disaster and Emergency Management (EM)
  - ✓ GOAL EM-1: Coordinated Disaster and Emergency Management<sup>3</sup>
  
- Disaster and Emergency Risk Reduction (ER)
  - ✓ GOAL ER-1: Minimal Risk from Accidental Release of Hazardous Materials
  - ✓ GOAL ER-2: Minimal Damage from Flooding and Drainage
  - ✓ GOAL ER-3: Minimal Risk from Geologic and Seismic Hazards
  - ✓ GOAL ER-4: Minimal Risk from Fire Hazards
  - ✓ GOAL ER-5: Safe Crossings and Goods Movement on Railroads
  - ✓ GOAL ER-6: An Adaptable and Resilient Community
  
- Disaster and Emergency Response and Public Safety (SAF)
  - ✓ GOAL SAF-1: A Safe Community
  
- Urban Infrastructure (INF)
  - ✓ GOAL INF-1: An Efficient Water Delivery and Storage System
  - ✓ GOAL INF-2: An Efficient Wastewater Collection and Treatment System
  
- Community Infrastructure and Facilities (CIF)
  - ✓ GOAL CIF-1: Minimal Solid Waste Generation
  - ✓ GOAL CIF-2: Coordinated Utility Infrastructure and Improvements
  - ✓ GOAL CIF-3: Elk Grove is a Leader in Innovative Technology Infrastructure
  - ✓ GOAL CIF-4: Schools Are an Integral Part of the Community
  - ✓ GOAL CIF-5: Community Facilities that Serve the Needs of the Community
  
- Infrastructure Financing and Phasing (IFP)
  - ✓ GOAL IFP-1: Infrastructure Improvement Costs Are Secured Prior to Development
  
- Community Health (HTH)
  - ✓ GOAL HTH-1: Healthy Living Options for Residents
  
- Community Services (CS)
  - ✓ GOAL CS-1: A Library System That Empowers Public Learning for Residents
  - ✓ GOAL CS-2: Services and Programs Support and Are Accessible to Children, Youth, and Seniors
  
- Noise (N)

- ✓ GOAL N-1: Sensitive Uses Are Protected from Noise Intrusion
- ✓ GOAL N-2: Community Noise Exposure is Minimized

### *Elk Grove Climate Action Plan (2019)*

In December 2009, the City was awarded an Energy Efficiency and Conservation Block Grant (EECBG) from the United States Department of Energy. The City dedicated a portion of its EECBG funds to prepare the City's first CAP which was adopted by the City Council on March 27, 2013.

This document serves as the first update to the City's CAP and will support the current CAP implementation work being done at the City while providing new information and strategies to reduce the City's GHG emissions.

The purpose of the CAP is to identify how the City will achieve State-recommended targets of reducing GHG emissions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030 pursuant to Assembly Bill (AB) 32 and Senate Bill (SB) 32. The CAP also demonstrates initial progress towards meeting the State's long-term 2050 goal of reducing emissions to 80 percent below 1990 levels as stated in Executive Order S-03-05. The CAP provides goals and associated measures, also referred to as GHG reduction strategies, in the sectors of energy use, transportation, land use, and solid waste.

### *City of Elk Grove Storm Drainage Master Plan*

The City has developed a comprehensive Storm Drainage Master Plan (SDMP) to provide a variety of drainage concepts for upgrading the existing storm drainage and flood control collection system. The SDMP identifies and analyzes the existing drainage deficiencies throughout the City to provide a range of drainage concepts for the construction of future facilities required to serve the City at buildout of the General Plan; to establish criteria for selecting and prioritizing projects; and to utilize the SDMP for the potential development of a capital drainage financing program. The SDMP combines the demands of flood-risk reduction with ecosystem enhancements while incorporating urban development and rural residential land uses to provide an effective plan that will meet both the City's and community's vision. The SDMP was recently updated in 2019.

### *City of Elk Grove Capital Improvement Program*

The Capital Improvement Program (CIP) includes all active projects and those expected to be undertaken during the coming five fiscal years. Specific projects and their scheduled completions were selected based on:

- Implementation of the City's General Plan;
- Existing traffic patterns and associated improvement needs;
- Projected traffic patterns, based on assumptions regarding the quantity and location of expected development;
- The need to establish a coherent roadway network, with strategic connections that distribute traffic flows efficiently;
- Minimizing disruptions associated with construction activity;
- Availability of funding; and
- City Council direction.

*City of Elk Grove Emergency Operations Plan*

The City’s Emergency Operations Plan (EOP) establishes an Emergency Management Organization (EMO) and assigns functions and tasks consistent with California’s Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS). It provides for the integration and coordination of planning efforts of multiple jurisdictions. This Plan was reviewed and approved by representatives from each City department, local special districts with emergency services responsibilities in the City, and the Sacramento Operational Area Office of Emergency Services. The content is based upon guidance approved and provided by the State of California, the Federal Emergency Management Agency and the federal Department of Homeland Security (DHS). The intent of the EOP is to provide direction on how to respond to an emergency from the initial onset, through an extended response, and into the recovery process.

*City of Elk Grove Bicycle, Pedestrian and Trail Master Plan*

The Bicycle, Pedestrian and Trails Master Plan (BPTMP or Master Plan) is intended to guide and influence pedestrian, bicycle, and trail policies, programs, and development standards to make biking and walking in the City of Elk Grove (City) more safe, comfortable, convenient, and enjoyable for all community members. The ultimate goal of the BPTMP is to increase the number of persons who walk and bicycle for transportation to work, school, and errands, and for recreation. The City seeks to have exemplary bicycle, pedestrian, and trail facilities that provide connectivity throughout the City and the wider Sacramento region in order to offer recreational opportunities and an alternative method for transportation for City residents.

**B.6.2. Administrative/Technical Mitigation Capabilities**

Table B-58 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Elk Grove.

*Table B-58 City of Elk Grove’s Administrative and Technical Mitigation Capabilities*

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	There are maintenance programs in place to reduce risks.
Mutual aid agreements	Y	California Master Mutual Aid Agreement, Law Enforcement Mutual Aid Agreement, Fire and Rescue Mutual Aid Agreement (via Cosumnes Fire District), Public Works Mutual Aid Agreement, County of Sacramento Operational Area Council, U.S. Army Corps of Engineers Rehabilitation Inspection PL84-99 Program, NFIP, County of Sacramento OES, County of Sacramento EMD
Other		Flood training, January 2016

Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y FT	Staff is adequate to enforce regulations. Staff is trained on hazards and mitigations. There is coordination between agencies and staff and it is effective.
Floodplain Administrator	Y FT	Staff is adequate to enforce regulations. Staff is trained on hazards and mitigations. There is coordination between agencies and staff and it is effective.
Emergency Manager	Y PT	Staff is adequate to enforce regulations. Staff is trained on hazards and mitigations. There is coordination between agencies and staff and it is effective.
Community Planner	Y FT	Staff is adequate to enforce regulations. Staff is trained on hazards and mitigations. There is coordination between agencies and staff and it is effective.
Civil Engineer	Y FT	Staff is adequate to enforce regulations. Staff is trained on hazards and mitigations. There is coordination between agencies and staff and it is effective.
GIS Coordinator	Y FT	Staff is adequate to enforce regulations. Staff is trained on hazards and mitigations. There is coordination between agencies and staff and it is effective.
Other		
<b>Technical</b>		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Reverse 911, pump station alarms, Local Hazard Mitigation Plan, Debris Management Plan
Hazard data and information	Y	FEMA Floodplain maps, localized flooding maps
Grant writing	Y	Various departments provide grant writing efforts.
Hazus analysis	N	
Other		
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
The City's Public Works Department is converting eight positions, currently filled by consultants, to full-time City employees in the Engineering Services Division. This includes positions in the Traffic and Drainage Engineering Sections. Conversion to full-time City employees will ensure consistency and improved institutional knowledge for understanding and mitigating potential flooding and traffic hazards.		

Source: City of Elk Grove

### B.6.3. Fiscal Mitigation Capabilities

Table B-59 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

**Table B-59 City of Elk Grove’s Fiscal Mitigation Capabilities**

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	There are funding resources that have been used in the past and can be used in the future.
Authority to levy taxes for specific purposes	Y	There are funding resources that have been used in the past and can be used in the future.
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	There are funding resources that have been used in the past and can be used in the future.
Storm water utility fee	Y	There are funding resources that have been used in the past and can be used in the future.
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	Y	There are funding resources that have been used in the past and can be used in the future.
Other federal funding programs	Y	FEMA, U.S. Army Corps of Engineers Rehabilitation Inspection PL84-99 Program
State funding programs	Y	Stormwater grant
Other		
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Continue to train staff, implement programs and enforce regulations.		

Source: City of Elk Grove

### **B.6.4. Mitigation Education, Outreach, and Partnerships**

Table B-60 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

**Table B-60 City of Elk Grove’s Mitigation Education, Outreach, and Partnerships**

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Emergency preparedness and disaster education information provided at local neighborhood meetings and via social media
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Public meetings to address emergency preparedness and flood control operations. Information is also provided at local outreach events and via social media.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Natural disaster or safety related school programs	Y	Earthquake and fire drills.
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	Y	Frequent training with regional partners such as SMUD, PG&E, County of Operational Emergency Services, Sacramento County Water Agency, CSD Fire and Department of Homeland Security
Other		
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Continue to train staff, implement programs and enforce regulations.		

Source: City of Elk Grove

### B.6.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- The City has participated in FEMA’s Map Modernization Project and the requirements of Title 44 of the Federal Code of Regulations (CFR), Section 65.10 of the National Flood Insurance Program (NFIP) regulations to certify the Laguna West levee system. The Laguna West levee system meets the design, operation and maintenance criteria set forth 44 CFR Section 65.10. The City also participates in the U.S. Army Corps of Engineers Rehabilitation Inspection PL84-99 Program for non-federal levees and non-project levees.
- The City implements levee operation and maintenance activities, which provide maintenance recommendations and requirements for specific levee inspections and maintenance operations. Levee inspections and maintenance activities include vegetation control, rutting/depressions, erosion control, slope stability, cracking, rodent control, encroachments/excavation, riprap revetments/banks, closure structures, underseepage relief wells/toe drainage system, seepage/sandboils, debris removal, roadway crown, utilities, minor structures, and mosquito abatement.
- Certified the Laguna West levees to participate in the Map Moderation Program and to be in compliance with FEMA’s 44 CFR Section 65.10 of the National Flood Insurance Program so that the federally subsidized flood insurance is available to the residents of the City;
- Adoption of resolution (#2007-189) that includes the City as an active member of the Sacramento Operational Area Council;
- Adoption of resolution (#25-2010) for compliance with SEMS/NIMS and certifies us as an “Accredited Disaster Council” to comply with the requirements of Cal OES;
- Mutual Aid Agreements with the following:
  - ✓ California Master Mutual Aid Agreement
  - ✓ Law Enforcement Mutual Aid Agreement
  - ✓ Fire and Rescue Mutual Aid Agreement (via Cosumnes Fire District)
  - ✓ Public Works Mutual Aid Agreement
  - ✓ Sacramento Operational Plan
- Social Media updates to inform the public of dangers and preventative steps to consider to mitigate any threats to their safety;

- Activated cooling and warming centers during extreme weather, as necessary;
- The Police Department's Problem Oriented Police Unit provides disaster education through neighborhood meetings or the Citizens Academy;
- Police Officers receive annual training on emergency response, including responses to local hazards or naturally created hazards;
- Disaster responses from the Police Department to Suburban Propane or the Sacramento Wastewater Treatment Plant;
- Development of a Disaster Debris Management Plan;
- Levee inspections through the U.S. Army Corps of Engineers Rehabilitation Inspection PL84-99 Program to ensure the City's levees are being properly maintained;
- Floodplain studies and LOMRs for new development projects and existing properties to be removed from the FEMA 100-year floodplain;
- Replacement of pump and electrical equipment for pump stations D50, D51, and D53 to protect public safety;
- Inspect and clean storm drainpipe on an annual basis to ensure system is operating in an efficient manner;
- Annual update of Storm Response and Flood Fighting Operation Plan to provide emergency information and support to City staff responding to both forecasted and actual storm events, and emergency information;
- Beaver Management Program to effectively address the challenges presented by beaver activity within the City's network of creeks, channels and storm drainage infrastructure to help prevent flooding;
- Requests and inquiries from the City's residents, businesses and insurance agents for flood zone information;
- Maintaining asset data in GIS to assist the City with planning, design, operation and maintenance efforts;
- Sandbag distribution during severe events to assist residents to protect their properties from flooding
- Drainage and floodplain easement information maintained in a GIS to assist the City with planning, design, operation and maintenance efforts;
- Public outreach efforts and education on emergency preparedness;
- Development of a comprehensive Storm Drainage Master Plan to provide a variety of drainage concepts for upgrading the existing storm drainage and flood control collection system to accommodate future development to serve the City at buildout of the General Plan; updated the SDMP in 2019.
- Identification of new and existing programs and activities that lay out a program level approach to holistically address vital function and values of drainage conveyance, flood control, aquatic resources and water quality that benefit public health and safety, minimize property damage and protect the environment; and
- The following flood mitigation projects were completed:
  - ✓ Emerald Vista Drive Storm Drain Improvements
  - ✓ Bradshaw/Sheldon Road Intersection Improvements
  - ✓ Blakemore Court and Hartwell Court Drainage Improvements
  - ✓ Storm Drain Pump Station Improvement Project
  - ✓ North Camden Drive Storm Drain Improvements
  - ✓ Sleepy Hollow Detention Basin Retrofit Project

## B.7 Mitigation Strategy

### B.7.1. Mitigation Goals and Objectives

The City of Elk Grove adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

### B.7.2. NFIP Mitigation Strategy

The City of Elk Grove joined the National Flood Insurance Program (NFIP) on October 15, 2001. As a participant of the NFIP, the City of Elk Grove has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Elk Grove will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Elk Grove actively participates with Sacramento County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Elk Grove as for Sacramento County since participation at the County level includes all local jurisdictions.

The City of Elk Grove Public Works Department provides public outreach activities, which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current flood mapping. In addition, the Public Works Department provides information about the stormwater management program and up-to-date information related to the maintenance of the City’s drainage system.

The NFIP’s Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Elk Grove is not a current participant in the CRS program.

More information about the floodplain administration in the City of Elk Grove can be found in Table B-61.

*Table B-61 City of Elk Grove Compliance with NFIP*

NFIP Topic	Comments
<b>Insurance Summary</b>	
How many NFIP policies are in the community? What is the total premium and coverage?	1,002 policies \$426,259 in premiums \$337,426,500 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	5 claims \$103,027.75 in claims paid 0 substantial damage claims
How many structures are exposed to flood risk within the community?	269 in 1% annual chance 6,737 in 0.2% annual chance

NFIP Topic	Comments
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	0 RL properties 0 SRL properties
Describe any areas of flood risk with limited NFIP policy coverage	No known areas.
<b>Staff Resources</b>	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	Yes, CFM certification has been attained
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	New development applications are routed to drainage staff for review. Staff reviews plans and also confirms that proposed developments are not located within SFHAs. FEMA floodplain information has been incorporated into the City's GIS database in addition to floodplain easement information. The City manages the flood control and flood preparedness webpages, which include a variety of flood related information. In addition, outreach information is provided at various events in the City.
What are the barriers to running an effective NFIP program in the community, if any?	There are minimal barriers to running an effective NFIP program. The community is fairly informed and educated regarding flooding concerns and the City has conducted various neighborhood workshops in the past. Education is key and the City will continue to educate the community regarding existing and potential flooding concerns.
<b>Compliance History</b>	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 7/27/2010
Is a CAV or CAC scheduled or needed?	Not scheduled
<b>Regulation</b>	
When did the community enter the NFIP?	10/15/2001
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes, the regulations are modeled after the State's model ordinance for non-coastal communities. The regulation implements policies in the General Plan relative to limiting development in the floodplain. In addition, habitable structures are not allowed to be constructed in the SFHA.

NFIP Topic	Comments
Provide an explanation of the permitting process.	New development applications are submitted to the Development Services Division and applications are then routed to various Divisions in the City, including Public Works. PW staff reviews plans, confirms that proposed developments are not located within SFHAs and provides comments as necessary. Staff also tracks these reviews.
<b>Community Rating System</b>	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

### B.7.3. Mitigation Actions

The planning team for the City of Elk Grove identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Levee Failure
- Pandemic
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Wildfire

After a review of capabilities and mitigation action alternatives, the following hazards were move to a low priority significance for mitigation action purposes:

- Earthquake
- Severe Weather: Extreme Cold and Freeze

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts

are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

### ***Multi-Hazard Actions***

#### ***Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan***

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**Hazards Addressed:** Multi-hazard (Climate Change, Dam Failure, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Levee Failure, Pandemic, Severe Weather: Extreme Cold and Freeze, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Wildfire)

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:** Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

**Other Alternatives:** No action

**Existing Planning Mechanisms through which Action will be Implemented:** Safety Element of General Plan

**Responsible Office:** City of Elk Grove Planning Department

**Priority (H, M, L):** High

**Cost Estimate:** Jurisdictional board/staff time

**Potential Funding:** Local budgets

**Benefits (avoided Losses):** Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

**Schedule:** As soon as possible

*Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness*

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**Hazards Addressed:** Multi-hazard (Climate Change, Dam Failure, Drought & Water Shortage, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Levee Failure, Pandemic, Severe Weather: Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Wildfire)

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:** The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

**Project Description:** A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms.

**Other Alternatives:** Continue public information activities currently in place.

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

**Responsible Office:** City of Elk Grove in partnership with the County

**Participating Jurisdictions:** County and all cities.

**Priority (H, M, L):** High

**Cost Estimate:** Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

**Benefits (Losses Avoided):** Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

**Potential Funding:** Local budgets, grant funds

**Timeline:** Ongoing/Annual public awareness campaign

**Action 3. Elk Grove Green Street Project: Repurposing Urban Runoff with Green Infrastructure Technologies**

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**Hazards Addressed:** Flood protection, Severe Weather: Heavy Rains and Storms, drainage deficiencies, water quality, habitat protection, education and outreach, and awareness and stewardship

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:**

- Reduce pollutant loads entering Elk Grove Creek and ultimately discharging into Stone Lakes National Wildlife Refuge and the Sacramento River - San Joaquin River Delta.
- Use pre-treated urban runoff for groundwater recharge.
- Protect riparian areas from further degradation.
- Reduce the risk of flooding by reducing runoff volumes and peak flows.

**Project Description:** The City prioritized a ½ mile section of major roadway for retrofit to repurpose stormwater as groundwater and provide other high-quality benefits in an impaired urbanized watershed. The Project will replace an outdated drainage system and impervious pavement with pervious materials and linear biofiltration planters connected to dry wells along the street frontage. The proposed green infrastructure will: 1) reduce pollutant loads entering Elk Grove Creek, which outfalls into the Stone Lakes National Wildlife Refuge and the Delta, 2) use pretreated urban runoff for groundwater recharge, and 3) provide flood protection. Assuming an average annual rainfall of 18", the 5.56 acre watershed will generate 6.84 acre-feet of stormwater for capture and infiltration. The Project, located on a major arterial that connects elementary, middle, and high schools will provide safer, enhanced pedestrian and bicycle access, traffic calming measures, and will enhance the City's Safe Routes to Schools Program

**Other Alternatives:** No action.

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** The Green Street Project was identified in the Storm Drainage Master Plan.

**Responsible Agency/ Department/Partners:** City of Elk Grove, Public Works Department - Drainage

**Cost Estimate:** \$5 million

**Benefits (Losses Avoided):** Reduce pollutant loads, impacts on groundwater supplies, riparian areas degradation, and reduce peak flows.

**Potential Funding:** Storm Drainage Utility Fee (Drainage Fund) and Grants

**Timeline:** Unknown

**Project Priority (H, M, L):** M

**Action 4. Mutual Aid Agreements**

---

**Hazards Addressed:** Multi-hazard (Climate Change, Dam Failure, Drought & Water Shortage, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Levee Failure, Pandemic, Severe Weather: Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Wildfire)

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:** Mutual aid agreements are necessary to be in place if a disaster occurs to provide integration and coordination of planning efforts for multiple jurisdictions. The intent of these agreements is to provide direction on how to respond to an emergency from the initial onset, through to extended response, and into the recovery process. Disasters know no boundaries and other emergency agencies are needed to help with emergency response.

**Project Description:** Ensure that Mutual Aid Agreements are in place such as: California Master Mutual Aid Agreement, Law Enforcement Mutual Aid Agreement, Fire and Rescue Mutual Aid Agreement (via Cosumnes Fire District), Public Works Mutual Aid Agreement, County of Sacramento Operational Area Council, U.S. Army Corps of Engineers Rehabilitation Inspection PL84-99 Program, NFIP, County of Sacramento OES, and County of Sacramento EMD.

Other Alternatives: No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** General Plan (Safety Element), Emergency Operation Plan, Storm Drainage Master Plan

**Responsible Agency/ Department/Partners:** City of Elk Grove, Public Works Department - Drainage; City of Elk Grove Police Department

**Cost Estimate:** Unknown

**Benefits (Losses Avoided):** Assistance with emergency response from other agencies.

**Potential Funding:** No funding is necessary to establish Mutual Aid Agreements. However, funding sources related to mutual aid responses, associated with Mutual Aid Agreements typically come from the requesting agency or from funds at the State or Federal level.

**Timeline:** On-going

**Project Priority (H, M, L):** High

**Action 5. City of Elk Grove's Storm Drainage Master Plan (SDMP)**

---

**Hazards Addressed:** Drought and Water Shortage, Flood protection, Severe Weather: Heavy Rains and Storms, drainage deficiencies, water quality, habitat protection, education and outreach, and awareness and stewardship

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:**

- Protect the value and function of the public storm drainage and flood control systems infrastructure and extend its useful life.
- Improve the storm drainage and flood control systems by incorporating features that promote water quality, groundwater recharge, and habitat protection, whenever feasible.
- Foster awareness and stewardship of water quality and aquatic ecosystems.
- Comply with applicable local, state and federal laws and regulations.

**Project Description:** The SDMP was developed to provide a variety of drainage concepts for upgrading the existing storm drainage and flood control collection system (Drainage System). The SDMP identifies and analyzes the existing drainage deficiencies throughout the City; provides a range of drainage concepts for the construction of future facilities required to serve the City at buildout of the General Plan; and establishes criteria for selecting and prioritizing projects. Furthermore, the SDMP may be utilized for the development of a capital drainage financing program. The SDMP combines the demands of flood-risk reduction with ecosystem enhancements while incorporating urban development and rural residential land uses to provide an effective plan that will meet both the City's and community's vision. A Minor Update to the SDMP was completed in 2019; the main purpose of the update was to provide a summary of projects completed since 2011, provide details regarding remaining projects, including implementation costs and schedules (if available), and provide information regarding new regulatory requirements related to stormwater management and flood control.

**Other Alternatives:**

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Implement the programs and projects identified in the SDMP

**Responsible Agency/ Department/Partners:** City of Elk Grove, Public Works Department - Drainage

**Cost Estimate:** Unknown

**Benefits (Losses Avoided):** Avoids flooding, degradation of water quality, and impacts on groundwater supplies.

**Potential Funding:** Storm Drainage Utility Fee (Drainage Fund), Sacramento County Zone 11A fee (Drainage Impact Fee Program), and Grants

**Timeline:** None

**Project Priority (H, M, L):** H

***Action 6. Create a Climate-Smart Stormwater Management System***

---

**Hazards Addressed:** Climate Change, Flood protection, drainage deficiencies, water quality, Levee Failure, Severe Weather: Heavy Rains and Storms

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:**

- Increase stormwater infrastructure capacity
- Climate change is likely to result in changes in precipitation patterns, with increases in the intensity of large storm events
- Atmospheric river phenomenon, and other events that bring significant fractions of annual average precipitation over a brief period of time, are likely to increase
- Current infrastructure standards are not updated with modeling to take into consideration these more intense storm events

**Project Description:** This work would include several items. 1) Work with Sacramento County to conduct appropriate analysis and begin the process to update the intensity, duration, and frequency curves used in stormwater infrastructure standards used for managing localized runoff and precipitation events. Incorporate updated modeling in standards for new development in the City, including capital improvement projects and the City’s Storm Drainage Master Plan. 2) Develop a comprehensive list of existing stormwater and drainage facilities that are at increased risk from failure or loss of performance from increases in the intensity of storm events. 3) Explore opportunities to add redundancy to the City’s existing stormwater and flood management systems (e.g., additional detention basins) to mitigate impacts from increased storm intensities as needed. 4) Explore and identify feasible strategies (e.g., riprap, hardening) to mitigate scour for bridges. Identify critical bridges (e.g., high-volume roadways) and prioritize improvements to these bridges to prevent scour and asset failure.

**Other Alternatives:** No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Storm Drainage Master Plan, City Construction Specifications and Improvement Standards, Sacramento County Hydrology Standards

**Responsible Agency/ Department/Partners:** City of Elk Grove, Development Services and Public Works Departments

**Cost Estimate:** \$300,000 (for the study)

**Benefits (Losses Avoided):** Increase preparedness for large flood events

**Potential Funding:** Storm Drainage Utility Fee (Drainage Fund), Sacramento County Zone 11A fee (Drainage Impact Fee Program), and Grants

**Timeline:** None

**Project Priority (H, M, L):** M

***Action 7. Implement a Comprehensive and Climate-Smart Green Infrastructure Strategy***

---

**Hazards Addressed:** Climate Change, Drought and Water Shortage, Extreme heat, Flooding, Drainage, Severe Weather: Heavy Rains and Storms

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:**

- Climate change is likely to result in changes in precipitation patterns and increases in extreme heat events.
- Current infrastructure standards are not sufficient to mitigate the impacts of climate change and need to be updated to adapt to the realities of climate change.
- Climate-smart green infrastructure will improve the City’s ability to reduce the impact of climate change (extreme heat and flooding) and recover following hazard events.

**Project Description:** Implement a climate-smart green infrastructure to mitigate and adapt to the impacts of climate change. This project would include several actions, including: 1) updating City Standards to require larger land development projects to incorporate principles of green infrastructure (e.g., bioswales, permeable pavements, rain gardens, linear parks, green roofs), which help mitigate the UHI effect in the City; 2) increase tree planting with a focus on carbon sequestration and environmental justice; and 3) update the City’s Municipal Code and other design guidelines to incorporate strategies to mitigate future increases in temperature and extreme heat events and mitigate the UHI effect in new development.

**Other Alternatives:** No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Municipal Code, Design Standards and Protocols

**Responsible Agency/ Department/Partners:** City of Elk Grove, Development Services and City Managers Departments

**Cost Estimate:** \$7.4 million

**Benefits (Losses Avoided):** Increase evapotranspiration and reduce heat-absorbing surfaces

**Potential Funding:** General Funds, Measure A Transportation sales tax and mitigation fee and Grants

**Timeline:** None

**Project Priority (H, M, L):** M

**Action 8.      *Upgrade the City’s Laguna West Levee System to Mitigate Climate-Related Flood Impacts***

---

**Hazards Addressed:** Climate Change, Flood, Levee Failure, Severe Weather: Heavy Rains and Storms

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:**

- California requires the 200-year floodplain to be considered in zoning and development regulations.

- The current Laguna West levee system can meet the FEMA 100-year floodplain but would need upgrades to provide full protection for the 200-year floodplain.
- Comply with applicable local, state, and federal laws and regulations.

**Project Description:** This project would work to develop policies to finance, plan, and construct infrastructure improvements to the Laguna West levee system to increase the City’s resilience to large-scale flooding events. The Laguna West levee system is accredited by FEMA as meeting 100-year storm event standards and provides protection to the Laguna West and Lakeside areas. However, the system would need to be raised an average of 3.5 feet to comply with the State 200-year flood protection standard and relieve new development of addition development obligations.

**Other Alternatives:** No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:**

**Responsible Agency/ Department/Partners:** City of Elk Grove, Public Works Department

**Cost Estimate:** \$30.8 million

**Benefits (Losses Avoided):** Increase preparedness for large flood events

**Potential Funding:** Storm Drainage Utility Fee (Drainage Fund), Sacramento County Zone 11A fee (Drainage Impact Fee Program), and Grants

**Timeline:** None

**Project Priority (H, M, L):** H

***Action 9. Establish a Resilient Pedestrian and Bicycle Infrastructure Network***

---

**Hazards Addressed:** Climate Change, Extreme heat

**Goals Addressed:** 1, 2, 3, 4, 5

**Issue/Background:**

- Climate change is likely to result in changes in precipitation patterns and increases in extreme heat events.
- The current infrastructure network for pedestrians and cyclists is not sufficient to mitigate the impacts of climate change, in particular for extreme heat.
- Pedestrians and cyclists are particularly vulnerable during extreme heat and providing a network that is able to adapt to extreme heat would allow the network to continue to be utilized during heat events.
- The pedestrian and bicycle network could be used to assist in mitigating the impact of extreme heat through increasing tree canopy and high-albedo surfaces throughout the network.

**Project Description:** Incorporate projections of future extreme heat impacts into the design and development of pedestrian and bicycle infrastructure in the City. Identify opportunities to upgrade existing

bicycle and pedestrian infrastructure to mitigate future extreme heat impacts and ensure comfort for users (e.g., tree canopy, high-albedo surfaces).

**Other Alternatives:** No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Bicycle, Pedestrian, and Trails Master Plan: Design Standards and Protocols

**Responsible Agency/ Department/Partners:** City of Elk Grove, Development Services and Public Works Departments

**Cost Estimate:** \$9.4 million

**Benefits (Losses Avoided):** Increase resilience of pedestrian and bicycle infrastructure, ensure continued ability to use pedestrian and bicycle infrastructure during heat events

**Potential Funding:** Active Transportation Fee, Local Transportation Funds, Measure A Transportation sales tax and mitigation fee and Grants

**Timeline:** None

**Project Priority (H, M, L):** M



SACRAMENTO COUNTY  
**WATER AGENCY**

## Annex M Sacramento County Water Agency

### M.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Sacramento County Water Agency (SCWA or District), a new participating jurisdiction to the 2021 Sacramento County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to SCWA, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

### M.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table M-1. Additional details on plan participation and District representatives are included in Appendix A.

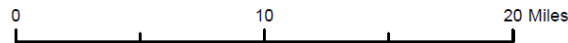
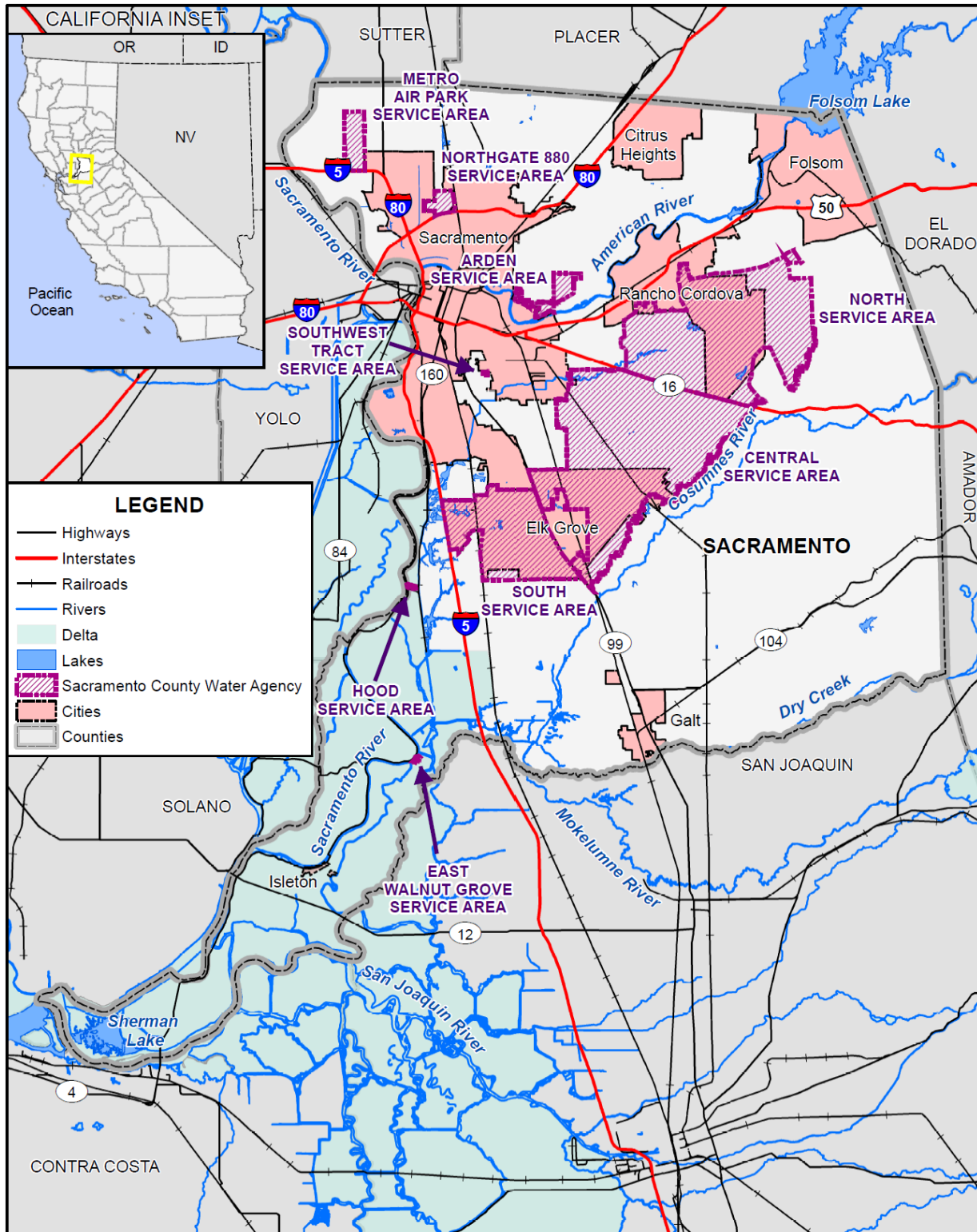
*Table M-1 SCWA – Planning Team*

Name	Position/Title	How Participated
Forrest Williams	Senior Engineer	Review documents, attend meetings
Carlos Smith	Associate Engineer	Identify hazards and assets, draft text, attend meetings

### M.3 District Profile

The District profile for the SCWA is detailed in the following sections. Figure M-1 displays a map and the location of the District within Sacramento County.

Figure M-1 SCWA



Data Source: Sacramento County Water Agency, Sacramento County GIS, Cal-Atlas; Map Date: 07/2021.

### M.3.1. Overview and Background

The Sacramento County Water Agency (SCWA) is dedicated to providing safe and reliable drinking water to over 55,000 homes and businesses in the following areas in Sacramento County:

- Laguna Vineyard (South Sacramento County)
- Mather-Sunrise
- Arden Park-Sierra Oaks
- Hood
- Northgate
- Southwest Tract
- Metro Air Park

Sacramento County Water Agency was formed in 1952 by a special legislative act of the State of California. The Sacramento County Board of Supervisors was designated to act as the ex-officio governing body or Board of Directors for SCWA. The Water Agency Act empowers the Board of Directors to create geographic zones with specific projects and benefits. Currently SCWA has the following zones:

- Zone 40 was created by the Water Agency Board of Directors on May 14, 1985 pursuant to Resolution No. 663 to fund the planning, design, and construction of major water supply facilities that benefit the Zone. Zone 40 revenue is provided from water development fees collected at the time of development and from Special User Fees included in bi-monthly water customer utility charges.
- Zone 13 was created by the Water Agency Board of Directors on May 5, 1987 to fund comprehensive long-range planning and engineering studies of flood control, water resources development, water supply management and water conservation beneficial to the Zone. Zone 13 includes all of Sacramento County excepting the cities of Sacramento, Folsom, Galt and Isleton, and its activities are funded by an annual per-parcel assessment on all real property within the Zone.
- Zone 41 was created by the Water Agency Board of Directors on June 13, 2000 pursuant to Resolution WA-2397, and constituted a reorganization of the Sacramento County Water Maintenance District. Zone 41 funds the operation and maintenance of a public drinking water system that includes water production, treatment, storage and distribution facilities, pursuant to permits issued by the California Department of Health Services. Revenue to fund Zone 41 activities is provided by utility charges, connection permit fees, construction water permits, and grants-all of which fund Water Supply Capital Facilities Design and Water Supply Facilities Operations and Administration. Zone 41 also provides wholesale water supply to the Elk Grove Water Service pursuant to the First Amended And Restated Master Water Agreement Between Sacramento County Water Agency And Florin Resources Conservation District/Elk Grove Water Service, June 28, 2002.
- Zone 50 was created by the Water Agency Board of Directors on June 1, 2004 pursuant to Resolution WA-2542. Zone 50 encompasses the Metro Air Park Special Planning Area, a commercial and industrial development adjacent to the Sacramento International Airport. Zone 50 funds certain capital facilities required to provide water supply to the Zone, as described in the Zone 50 Water Supply Master Plan adopted on October 25, 2005; Zone 50 revenue is provided from water development fees. Water for the Zone is purchased from the City of Sacramento pursuant to an October 12, 2004 Wholesale And/or Wheeling Water Service Agreement.

## M.4 Hazard Identification

SCWA identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table M-2).

**Table M-2 SCWA—Hazard Identification Assessment**

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Unlikely	Catastrophic	High	Low
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Extensive	Occasional	Limited	Medium	Low
Earthquake Liquefaction	Limited	Unlikely	Limited	Low	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Catastrophic	Medium	Medium
Floods: Localized Stormwater	Limited	Occasional	Limited	Low	Medium
Landslides, Mudslides, and Debris Flow	Limited	Unlikely	Limited	Low	Medium
Levee Failure	Limited	Occasional	Critical	High	Medium
Pandemic	Extensive	Likely	Critical	Low	Medium
Severe Weather: Extreme Cold and Freeze	Extensive	Occasional	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Low	Medium
Severe Weather: Wind and Tornado	Extensive	Highly Likely	Limited	Low	Low
Subsidence	Limited	Unlikely	Limited	Low	Medium
Volcano	Extensive	Unlikely	Limited	Low	Low
Wildfire	Limited	Likely	Limited	Low	High
<b>Geographic Extent</b> Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area		<b>Magnitude/Severity</b> Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid			
<b>Likelihood of Future Occurrences</b> Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		<b>Significance</b> Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact			
		<b>Climate Change Influence</b> Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact			

## M.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Sacramento County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Sacramento County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

### M.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section M.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table M-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Sacramento County Planning Area.

### M.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

#### *Assets at Risk and Critical Facilities*

This section considers the SCWA's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

*Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, (3) Hazardous Materials and Solid Waste Facilities.

Table M-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. SCWA's physical assets, valued at over \$565 million, consist of the buildings and infrastructure to support the District's operations.

*Table M-3 SCWA Critical Facilities, Infrastructure, and Other District Assets*

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
FRWA Surface Water Intake Plant	Essential	\$54,948,984	Flood, Earthquake, Severe Weather
FRWA Raw Water Pipeline	Essential	\$8,336,275	Earthquake
Vineyard Surface Water Treatment Plant	Essential	\$244,140,313	Earthquake, Wildfire, Severe Weather
Water Treatment Plants	Essential	\$80,518,712	Flood (Levee/Dam/100Yr/500Yr), Earthquake, Wildfire, Severe Weather
Water Wells	Essential	\$28,767,926	Flood (Levee/Dam/100Yr/500Yr), Severe Weather, Wildfire
Storage Tank & Booster Stations	Essential	\$10,815,231	Flood (Levee/Dam/100Yr/500Yr), Earthquake, Severe Weather, Wildfire
SCADA System	Essential	\$1,136,504	Flood (Levee/Dam), Severe Weather, Wildfire
Water Transmission Mains	Essential (165 miles)	98,190,500	Earthquake
Water Distributions Mains	Essential (715 miles)	\$38,975,447	Earthquake
<b>Total</b>		<b>\$565,82,892</b>	

Source: SCWA

### *Natural Resources*

SCWA has a variety of natural resources of value to the District. These natural resources parallels that of Sacramento County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

### *Historic and Cultural Resources*

SCWA has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Sacramento County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

### *Growth and Development Trends*

General growth in the District parallels that of the Sacramento County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

## Future Development

The District has limited control (water availability) over future development in areas the District services. Future development in these areas parallels that of the Sacramento County Planning Area. More general information on growth and development in Sacramento County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Sacramento County Vulnerability and Assets at Risk of the Base Plan.

The District noted that new facilities are constructed based on development demands. The 2016 Zone 40 Water System Infrastructure Plan identified new growth areas and the planned water facilities to support the new growth.

### M.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table M-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Sacramento County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

## Power Outage/Power Failure

An impact of almost all hazards below relates to power outage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

The District noted no significant impacts to date. All major water production, treatment, and delivery facilities have fixed emergency standby generators. Most well sites have on site generations or portable emergency generators available. Most facilities have at least a minimum of 24-hours of continuous back up power before fuel or servicing becomes an issue.

### *Public Safety Power Shutoff (PSPS)*

A new intentional disruption type of power outage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan. The District has not been affected by PSPS events to date.

## *Dam Failure*

**Likelihood of Future Occurrence**—Unlikely

**Vulnerability**—High

### Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

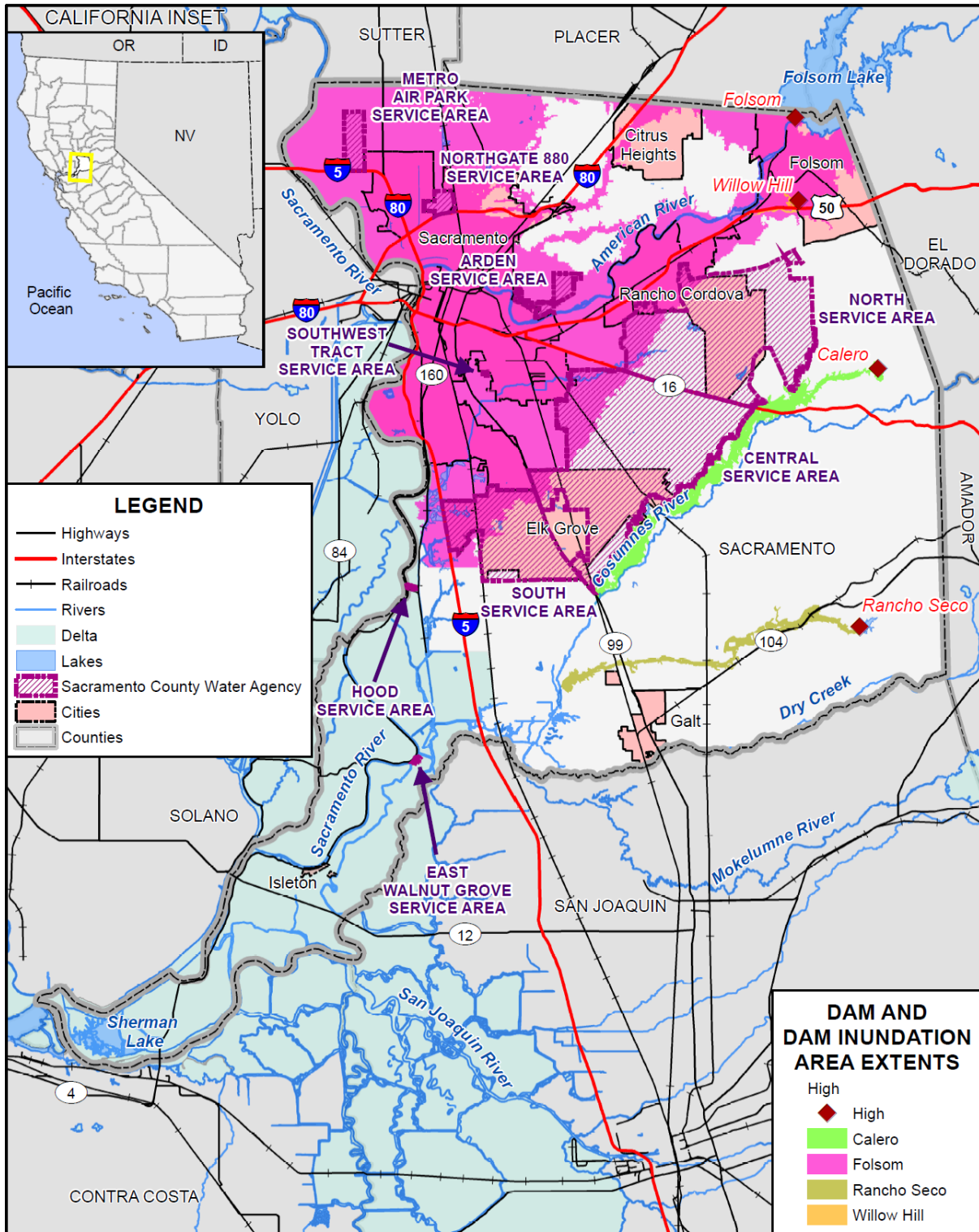
## Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.7 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Dams inside the County that can affect the District can be seen on Figure M-2. Dams outside the County that can affect the District can be seen on Figure M-3. The Folsom Dam 235,000 cfs release is shown on Figure M-4. While Figure M-2 and Figure M-3 illustrate dam inundation areas from an actual dam failure, Figure M-3, the Folsom 235,000 cfs scenario reflects the likely inundation area associated with a possible “super” release of water from Folsom. This updated Folsom scenario reflects the Folsom dam improvements which make a dam failure unlikely, with any resulting downstream inundation from Folsom associated with an intentional release of water from the dam. It is anticipated that the worst case scenario would be a 235,000 cfs release, which is comparable to a 200-year flood. The area labeled Folsom 235,000 CFS Release Riverine Inundation is the American River corridor and the backwater of the Natomas East Main Drainage Channel (aka Steelhead Creek) to the flood control pump station.

Figure M-2 SCWA – Dam Inundation Areas from Dams Inside the County



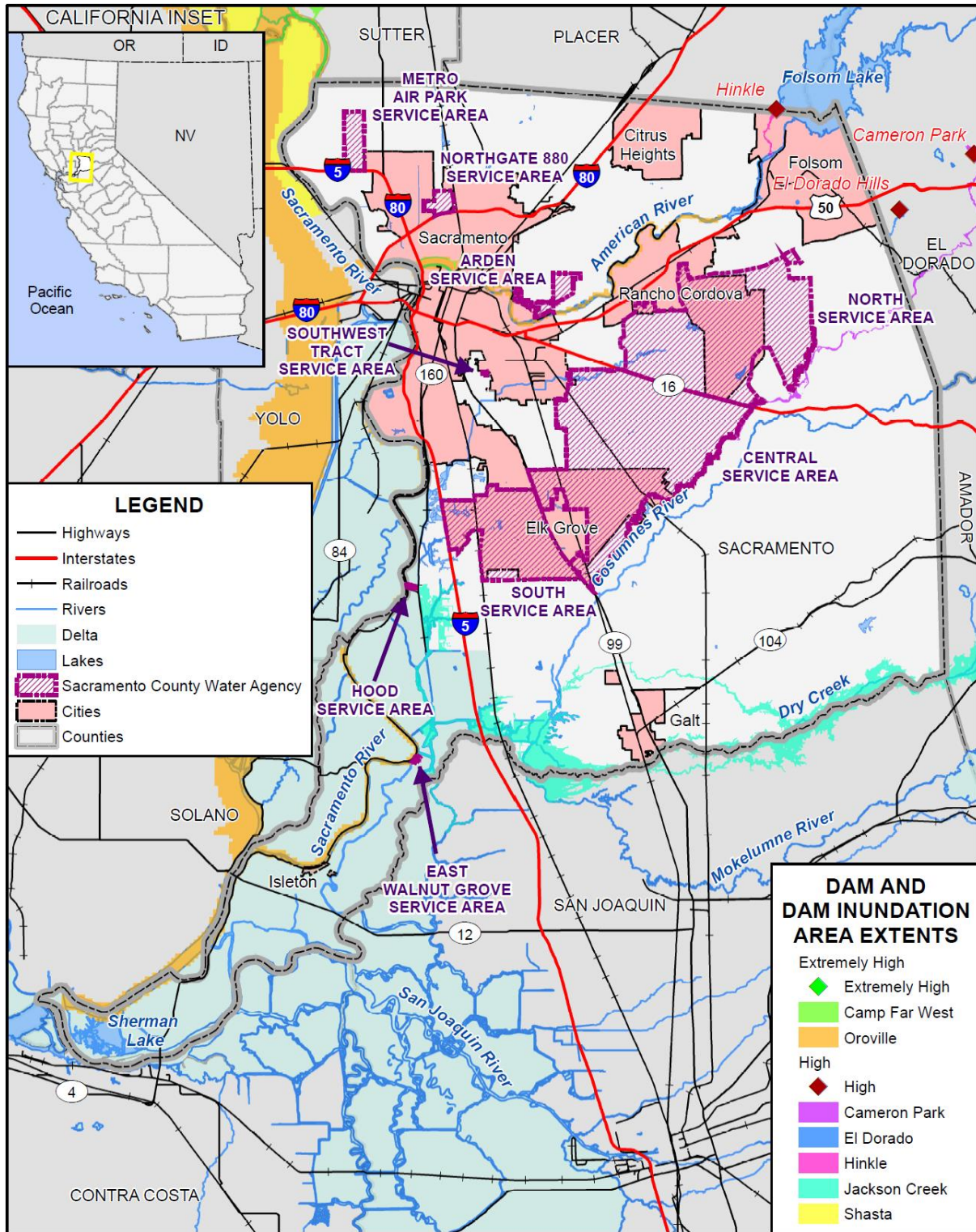
FOSTER MORRISON CONSULTING

0 10 20 Miles

SACRAMENTO COUNTY

Data Source: County-provided dam inundation data (FOLSOM\_DAM\_INUNDATION\_AREA.shp 2016), DWR DSOD Data 2020 and Cal OES Dam Status 10/2017, Sacramento County GIS, Cal-Atlas; Map Date: 07/2021.

Figure M-3 SCWA – Dam Inundation Areas from Dams Outside the County

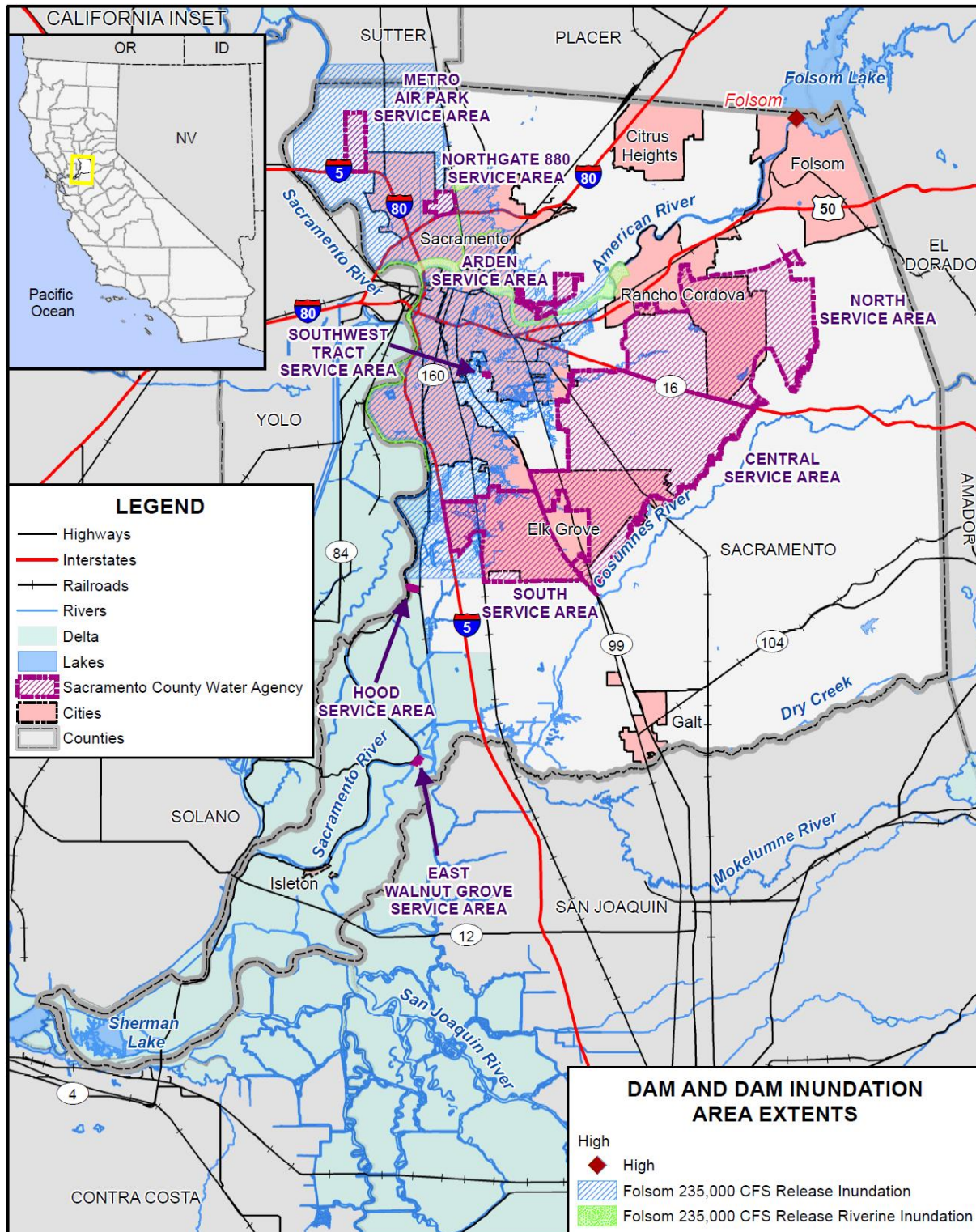


0 10 20 Miles



Data Source: DWR DSOD Data 2020 and Cal OES Dam Status 10/2017, Sacramento County Water Agency, Sacramento County GIS, Cal-Atlas; Map Date: 07/2021.

Figure M-4 SCWA – Folsom Dam 235,000 cfs Scenario



Data Source: County-provided dam inundation data (CA\_DWR\_200YEAR\_FLOODPLAIN.zip 2020), DWR DSOD Data 2020, Sacramento County GIS, Cal-Atlas; Map Date: 07/2021.

## Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District.

## Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

All water facilities serving the Metro Air Park and Northgate industrial service areas would be inundated and forced to shut down operations until floodwaters recede – catastrophic impacts. Equipment replacements most likely needed.

Three (3) direct feed water wells in the Arden Park Vista service area would be inundated and forced to shut down operations until floodwaters recede. Equipment replacements most likely needed. Loss of the 3 wells sites would be critical to the operation of the west end of water system, however, provide all of the other water system wells sites are operational sufficient water supply is expected at reduced water pressures. Emergency inter-ties with adjacent water purveyors exist.

Zone 40 North Service Area – Mather main base water facilities are located on the edge of the flood inundation boundary. Insufficient information at this time to determine the extent of flood damage and impacts to the operations of the water facilities. Other nearby water facilities would be operational.

Zone 40 South Service Area - all facilities west of the UPRR tracks would be inundated and forced to shut down operations until floodwaters recede. Insufficient information at this time to determine the extent of flood damage and repairs needed to the water facilities. The Dwight Rd WTP and several well sites are also within the flood inundation boundary. Damage to these facilities is also expected. Other nearby water facilities would be operational to supply water to the area but at reduced water pressures.

The District also would be impacted by the loss of access to remote water facilities

## Assets at Risk

The District noted the following assets at risk

- Arden Park Vista Service Area: 3 Direct Feed Wells.
- Zone 40 South Service Area: All water facilities west of the UPRR tracks, Dwight Rd WTP, several well sites.
- Zone 40 North Service Area: All water facilities on Mather main base area.
- Northgate Service Area: All water facilities (direct feed wells).
- Metro Air Park: All water facilities

## *Drought & Water Shortage*

**Likelihood of Future Occurrence**–Likely  
**Vulnerability**–High

### **Hazard Profile and Problem Description**

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

### **Location and Extent**

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.8 of the Base Plan.

### **Past Occurrences**

There has been two state and one federal disaster declaration due to drought since 1950. This can be seen in Table M-4.

*Table M-4 Sacramento County – State and Federal Disaster Declarations Summary 1950-2020*

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	2008, 2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.8 of the Base Plan.

The District noted no specific physical damages but impacts (reduced use) to the operations of surface water facilities and reliance on more use of groundwater resources or water transfers. Water restrictions leads to reduced revenue for the District.

### **Vulnerability to and Impacts from Drought and Water Shortage**

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power outage and failure can be found in the discussion at the beginning of Section M.5.3, as well as in Section 4.3.3 of the Base Plan.

Declared water shortage/drought events trigger the implantation of the Sacramento County Water Agency Water Shortage Contingency Plan (ver 4-19-21) – water restrictions.

### **Assets at Risk**

The FRWA intake and pipeline facilities and Vineyard surface water treatment plant rely solely on the availability of Sacramento river water. Reduced surface water allocations minimize the use of these major facilities.

## *Earthquake*

**Likelihood of Future Occurrence**–Occasional

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

### **Location and Extent**

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.9 of the Base Plan. Geological literature indicates that no major active faults transect the County; however, there are several subsurface faults in the Delta. The Midland fault, buried under alluvium, extends north of Bethel Island in the Delta to the east of Lake Berryessa and is considered inactive but possibly capable of generating a near 7.0 (Richter Scale) earthquake. This magnitude figure is speculative based on an 1895 earthquake measuring 6.9 on the Richter Scale with an epicenter possibly in the Midland Fault vicinity. However, oil and gas companies exploring the area's energy potential have identified several subsurface faults, none of which show any recent surface rupture. A second, presumably inactive, fault is in the vicinity of Citrus Heights near Antelope Road. This fault's only exposure is along a railroad cut where offsetting geologic beds can be seen. Neither the lateral extent of the trace, the magnitude of the offset, nor the age of faulting has been determined. To the east, the Bear Mountain fault zone trends northwest-southeast through Amador and El Dorado Counties. Geologists believe this series of faults has not been active in historic time.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Sacramento County and the District fall within a low to moderate shake risk, with most of the moderate risk in the Delta area of the County.

## Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

## Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Sacramento County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. There are none of these buildings owned by the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The SCWA is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

There is a limited impact on operations. A majority of the water system facilities are built after year 2000 and designed and construction to the latest seismic standards. Water production/treatment/storage facilities are open space facilities with most process equipment and tanks exposed, not housed in buildings. Most sites are unmanned. There is potential widespread / long-term loss of electrical power may affect the ability to operate all necessary water facilities with back up emergency generators. Access to remote facilities could be hampered.

## Assets at Risk

The District noted the following assets at risk:

- Elevated water storage tanks in the North Service Area (Mather) need seismic retrofitting improvements. At risk of failure during a major earthquake event.
- Water transmission mains and distribution mains – potential pipe joint separation resulting in water leakage

### *Flood: 1%/0.2% Annual Chance*

**Likelihood of Future Occurrence**—Occasional/Unlikely

**Vulnerability**—Medium

#### **Hazard Profile and Problem Description**

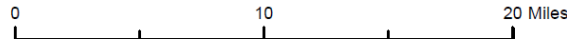
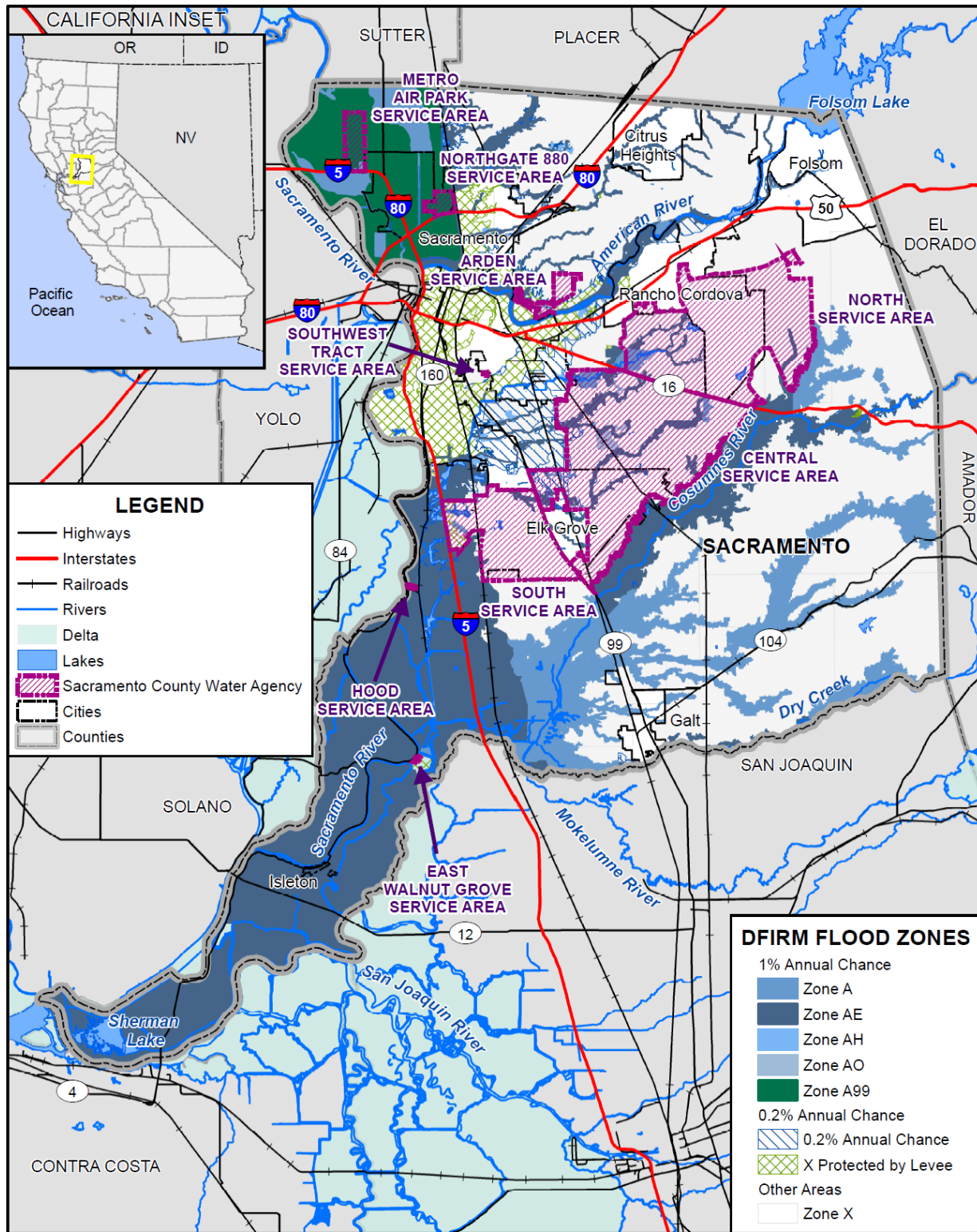
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Sacramento County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.11 of the Base Plan, the Sacramento County Planning Area and the SCWA have been subject to historical flooding.

#### **Location and Extent**

The SCWA has areas located in the 1% and 0.2% annual chance floodplain. This is seen in Figure M-5.

Figure M-5 SCWA – FEMA DFIRM Flood Zones



Data Source: FEMA NFHL 07/19/2018, Sacramento County Water Agency, Sacramento County GIS, Cal-Atlas; Map Date: 07/2021.

Table M-5 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

*Table M-5 SCWA– DFIRM Flood Hazard Zones*

Flood Zone	Description	Flood Zone Present in the District
A	100-year Flood: No base flood elevations provided	X
AE	100-year Flood: Base flood elevations provided	X
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	X
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	X
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones	X
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

### Past Occurrences

A list of state and federal disaster declarations for Sacramento County from flooding is shown on Table M-6. These events also likely affected the District to some degree.

*Table M-6 Sacramento County – State and Federal Disaster Declarations from Flood 1950-2020*

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	19	1950, 1955, 1958 (twice), 1963, 1969, 1982 (twice), 1983, 1986, 1995 (twice), 1996, 1997, 1998, 2008, 2017 (three times)	14	1955, 1958, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 1998, 2006, 2017 (three times)

Source: Cal OES, FEMA

## Vulnerability to and Impacts from Flood

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Regional and local flooding may affect access to certain water facilities.

### Assets at Risk

The District noted the following assets at risk:

- Arden Park Vista Service Area (Zone X – Levee / 500yr): 3 direct feed well sites.
- Northgate Service Area (Zone A99): All (6) direct feed well sites.
- Metro Air Park Service Area (Zone A99): Water storage and booster station
- Laguna-Vineyard Service Area (Zone X – Levee): 2 raw water well sites / water treatment plant
- Laguna-Vineyard Service Area (Zone AE/500Yr): Water storage tank and booster station/ well sites
- Hood Service Area (Zone AE): All (3) direct feed well sites
- East Walnut Grove Service Area (Zone X – Levee): All well sites / tank and booster station

## *Levee Failure*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—High

### **Hazard Profile and Problem Description**

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made.

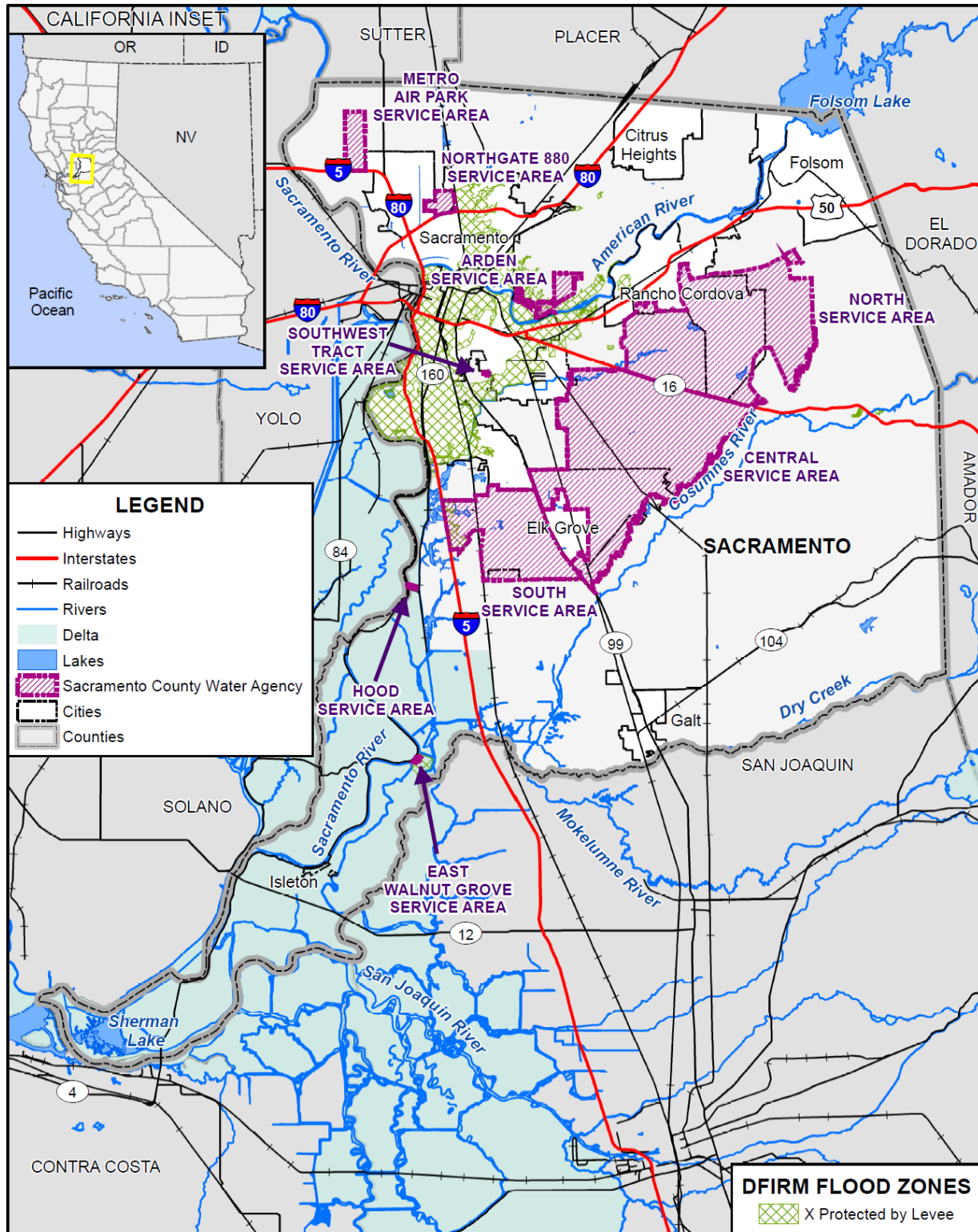
Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

### **Location and Extent**

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the District vary by event and location. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. When northern California dams and reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees.

Location of areas protected by areas are shown on Figure M-6.

Figure M-6 SCWA – DFIRM X Protected by Levee Areas



0 10 20 Miles



Data Source: FEMA NFHL 07/19/2018, Sacramento County Water Agency, Sacramento County GIS, Cal-Atlas; Map Date: 07/2021.

## Past Occurrences

There have been no federal or state disaster declarations from levee failure. The District Planning Team noted no past occurrences of levee failures.

## Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

The District note that access to remote water facilities may be hampered.

## Assets at Risk

The District noted the following assets at risk:

- All water facilities serving the Metro Air Park and Northgate industrial service areas are at risk of potential flood inundation due to levee failure (Zone A99) requiring shut down of all operations until floodwaters recede. Equipment replacements most likely needed.
- Three (3) direct feed water wells in the Arden Park Vista service area are at risk of potential flood inundation due to levee failure (Zone X / Protected by Levee) and force shut down of well operations until floodwaters recede. Equipment replacements most likely needed. Loss of the 3 wells sites would be critical to the operation of the west end of water system, however, provide all of the other water system wells sites are operational sufficient water supply is expected at reduced water pressures. Emergency inter-ties with adjacent water purveyors exist.
- Zone 40 South Service Area – Two (2) raw water wells near I-5 are at risk of potential flood inundation due to levee failure (Zone X / Protected by Levee) and may force shut down of well operations until floodwaters recede.

## M.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships.

## M.6.1. Regulatory Mitigation Capabilities

Table M-7 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the SCWA.

*Table M-7 SCWA Regulatory Mitigation Capabilities*

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N/A	
Capital Improvements Plan	N/A	
Economic Development Plan	N/A	
Local Emergency Operations Plan	N/A	
Continuity of Operations Plan	N/A	
Transportation Plan	N/A	
Stormwater Management Plan/Program	N/A	
Engineering Studies for Streams	N/A	
Community Wildfire Protection Plan	N/A	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	SCWA 2020 Urban Water Management Plan. SCWA Water Shortage Contingency Plan SCWA Emergency Response Plans SCWA Risk and Resilience Assessments SCWA Zone 40 Water Supply Master Plan SCWA Zone 40 Water System Infrastructure Plan
<b>Building Code, Permitting, and Inspections</b>	<b>Y/N</b>	<b>Are codes adequately enforced?</b>
Building Code	N/A	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score:
Fire department ISO rating:	N/A	Rating:
Site plan review requirements	N/A	
<b>Land Use Planning and Ordinances</b>	<b>Y/N</b>	<b>Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?</b>
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Floodplain ordinance	N/A	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	
Flood insurance rate maps	N/A	
Elevation Certificates	N/A	

Acquisition of land for open space and public recreation uses	N/A
Erosion or sediment control program	N/A
Other	
<b>How can these capabilities be expanded and improved to reduce risk?</b>	
The District will look to expand upon existing plans to reduce hazard risks in the future.	

Source: SCWA

## M.6.2. Administrative/Technical Mitigation Capabilities

Table M-8 identifies the District department(s) responsible for activities related to mitigation and loss prevention in SCWA.

*Table M-8 SCWA's Administrative and Technical Mitigation Capabilities*

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Preventative maintenance program and annual inspections
Mutual aid agreements	Y	Multiple agreements with multiple entities. Coordination is effective.
Other		
		<b>Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?</b>
<b>Staff</b>	<b>Y/N FT/PT</b>	
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	N	
Community Planner	N/A	
Civil Engineer	Y	Adequate and trained on mitigation. Coordination is effective.
GIS Coordinator	Y	Adequate and trained on mitigation. Coordination is effective.
Other		
<b>Technical</b>		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	SCADA System/Alarm Systems/CCTV Systems
Hazard data and information	Y	
Grant writing	N	
Hazus analysis	N	
Other		

**How can these capabilities be expanded and improved to reduce risk?**

Need technical resources and staff for grant applications. This would increase the Districts capabilities.

Source: SCWA

### M.6.3. Fiscal Mitigation Capabilities

Table M-9 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

*Table M-9 SCWA’s Fiscal Mitigation Capabilities*

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	Water service use fees fund O&M projects
Impact fees for new development	Y	Zone 40 development fees fund CIP projects
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	Applied for federal grants
State funding programs	Y	Applied for state grants
Other		
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Seek all available grant-funding opportunities to cost share on CIP and rehabilitation projects. This includes federal, state, and local grants.		

Source: SCWA

### M.6.4. Mitigation Education, Outreach, and Partnerships

Table M-10 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

*Table M-10 SCWA’s Mitigation Education, Outreach, and Partnerships*

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N/A	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Water conservation program – Water Wise
Natural disaster or safety related school programs	N/A	
StormReady certification	N/A	
Firewise Communities certification	N/A	
Public-private partnership initiatives addressing disaster-related issues	N/A	
Other	N/A	
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
SCWA outreaches to service area customers only. This could be improved by web site improvements, additional brochure mailings, and in person site visits. Improve water conservation enforcements – additional staff.		

Source: SCWA

## M.7 Mitigation Strategy

### M.7.1. Mitigation Goals and Objectives

The SCWA adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

### M.7.2. Mitigation Actions

The planning team for the SCWA identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Levee Failure

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and

projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

### ***Action 1. Flood Hazard Mitigation***

---

**Hazards Addressed:** Flooding – Dam failure / Levee failure / 100yr & 500 yr flood events.

**Goals Addressed:** 1, 3, & 4

**Issue/Background:** SCWA operates certain water production/distribution facilities (water wells, storage tank & booster stations, and water treatment plants) subjected to potential major flood damage caused by dam or levee failures, and 100-year / 500-year flood events. To date no flooding events have damaged any of these water facilities.

**Project Description:** To reduce the risk and increase the resiliency of critical water supply infrastructure from major flood damage or complete loss, SCWA is evaluating the following mitigation actions/projects:

1. Construct floodwalls/berms around entire facilities or critical equipment/buildings.
2. Elevate critical equipment, buildings, and hazardous materials/chemicals/fuels above flood elevation.
3. Install tie-downs on tanks and buildings.
4. Flood-proof emergency generator and control buildings.
5. Ensure spare parts and replacement equipment are readily available.

**Other Alternatives:** Support and participate in county, regional, state and federal flood mitigation projects that will reduce flooding in water service areas affected by the above flood hazard

**Existing Planning Mechanisms through which Action will be Implemented:**  
SCWA Operations and Maintenance engineering planning

**Responsible Office:** SCWA Operations and Maintenance Engineering

**Cost Estimate:** TBD

**Potential Funding:** FEMA, Cal OES, RWA, and Bureau of Reclamation grants.

**Benefits (avoided Losses):** Avoid significant equipment damage and shutdowns of water production facilities due to floodwater inundations. Maintain continuous operation of water systems to supply clean reliable drinking water and fire protection flow.

**Schedule:** Ongoing.

**Priority (H, M, L):** Low

## *Action 2. Improve Water Supply Portfolio*

---

**Hazards Addressed:** Drought & Water shortage

**Goals Addressed:** 1, 2, 3, 4

**Issue/Background:** Improve water supply reliability and prevent or minimize water supply shortages triggered by water supply operational changes and catastrophic events.

**Project Description:** Maintain sufficient annual water supplies for domestic, commercial, industrial consumption uses and provide fire protection. Water conservation enforcement actions. Public outreach. Manage conjunctive use of water system. Construct CIP projects that improve water storage capacity and water distribution. Conduct water audits. Seek additional water rights / contracts.

**Other Alternatives:** No action.

**Existing Planning Mechanisms through which Action will be Implemented:** Annual Water Supply and Demand Assessments (WSDA). Emergency Response Plan (ERP). Mutual aid agreements with adjacent water purveyors.

**Responsible Office:** SCWA Operations and Maintenance Engineering

**Cost Estimate:** TBD

**Potential Funding:** FEMA grants, Bureau of Reclamation, RWA funding.

**Benefits (avoided Losses):** Increased protection of District facilities from drought and water shortage issues. Ability of the District to provide water for both consumption and fire suppression.

**Schedule:** Ongoing

**Priority (H, M, L):** Medium

## *Action 3. Seismic Upgrades and Inspections*

---

**Hazards Addressed:** Earthquake

**Goals Addressed:** 1, 3, & 4

**Issue/Background:** SCWA owns and operates two aged, elevated water storage tanks previous owned by the U.S. Air Force that do not meet current seismic standards. Recent seismic assessments determined insufficient foundation mass and strength capacity, insufficient foundation anchorage, and tension only braced frame braces.

Potential above and below ground pipeline joint separation caused by seismic activity leading to water leaks and forced shutdowns.

**Project Description:** Design and prepare contract documents to correct elevated storage tank seismic deficiencies. Publicly bid for construction of seismic upgrades to meet current seismic standards. Conduct pipeline leak detection surveys following major seismic events.

**Other Alternatives:** Reduce the volume of stored water in tanks or remove them from service and lose system storage capacity. Build new ground level storage tanks at a greater expense.

**Existing Planning Mechanisms through which Action will be Implemented:** SCWA Zone 41 budget and project planning/scheduling.

**Responsible Office:** SCWA Operations and Maintenance Engineering

**Cost Estimate:**

- Mather housing elevated water tank: \$2,066,817 (Preliminary)
- Mather main base elevated water tank: \$ 1,435,084 (Preliminary)
- Pipeline leak detection surveys: TBD

**Potential Funding:** SCWA Zone 41. Seek FEMA, Bureau of Reclamation, and RWA grants

**Benefits (avoided Losses):** Maintain the ability to store and distribute water for drinking and fire protection. Reduce water loss in pipelines and water contamination.

**Schedule:** Elevated storage tanks: Complete within the next three to five years. Pipeline leak detection surveys: As needed

**Priority (H, M, L):** Medium

# APPENDIX C

## DWR SUBMITTAL TABLES

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Table 2-1 R

Submittal Table 2-1 Retail: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
Add additional rows as needed			
CA3410008	Elk Grove Water District	13,229	6,296
<b>Total</b>		13,229	6,296
<b>DWR NOTES:</b> <b>Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.</b>			
<b>NOTES: Volume of water supplied to retail customers and does not include estimate for loss.</b>			

Table 2-2

<b>Submittal Table 2-2: Plan Identification</b>		
<b>Select One</b>	<b>Type of Plan</b>	<b>Name of Regional Alliance or RUWMP (Drop Down List)</b>
<input checked="" type="checkbox"/>	<b>Individual UWMP</b>	
	If Water Supplier is also a member of a SB X7-7 Regional Alliance, select name from the drop-down.	
<input type="checkbox"/>	<b>Regional Urban Water Management Plan (RUWMP)</b>	
	If Supplier selected RUWMP, select name from the drop-down.	
<b>NOTES:</b>		

Table 2-3

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

Table 2-4 R

<b>Submittal Table 2-4 Retail: Water Supplier Information Exchange Water Code Section 10631(h)</b>
The retail Supplier has informed the following wholesale supplier(s) of projected water use.
<b>Wholesale Water Supplier Name</b>
Add additional rows as needed
Sacramento County Water Agency
<b>NOTES:</b>

Table 3-1 R

<b>Submittal Table 3-1 Retail: Population - Current and Projected Water Code Section 10631(a)</b>						
Population Served	2025	2030	2035	2040	2045	2050(opt)
	44,254	47,842	48,277	48,379	48,582	48,891
<b>NOTES:</b>						

Table 4-1 R

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual Water Code Section 10631(d)(1)			
Use Type	Additional Description (as needed)	2025 Actual Water Use	
<b>Drop down list</b> May select each use multiple times These are the only use types that will be recognized by the WUEdata online submittal tool		Potable or Non-Potable (OPTIONAL) Drop down list	Volume (AF)
Add additional rows as needed			
Other (optional)	Residential	Potable	4,846
Other (optional)	Commercial, Industrial, Institutional	Potable	1,450
Subtotal Potable			6296
Subtotal Non-Potable			0
<b>Total</b>			<b>6,296</b>
<b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.</b>			
<b>NOTES:</b>			

Table 4-2 R

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected Water Code Section 10631(d)(1)							
Use Type	Additional Description (as needed)	Projected Water Use (Report To the Extent that Records are Available)					2050 opt (AF)
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		Potable or Non-Potable (OPTIONAL) Drop down list	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	
Add additional rows as needed.							
Other (optional)	Residential	Potable	5,059	5,306	5,315	5,335	5,364
Other (optional)	Non-Residential	Potable	1,465	1,546	1,548	1,555	1,565
Distribution System Water Loss		Potable	336	353	354	355	357
		Subtotal Potable	6,860	7,205	7,217	7,245	7,286
		Subtotal Non-Potable	0	0	0	0	0
		<b>Total</b>	<b>6,860</b>	<b>7,205</b>	<b>7,217</b>	<b>7,245</b>	<b>7,286</b>
<b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.</b>							
<b>NOTES: Projected water loss values reported in the table represent the targets based on the State’s computed water loss standard (as a percent of water supplied) applicable to the District over the planning period.</b>							

Table 4-3 R

<b>Submittal Table 4-3 Retail: Inclusion in Water Use Projections                      Water Code Section 10631 (a), 10631 (d)(4)(A), and 10631 (d)(4)(B)</b>	
<b>Are Future Water Savings Included in Projections?</b> Drop down list (y/n)	Yes
If "Yes" to above, <b>state the section or page number</b> , in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found. <i>Optional</i> Suppliers may complete Optional Submittal Table 4-4 R to quantify the expected savings.	Section 4.4
<b>Are Lower Income Residential Demands Included In Projections?</b> Drop down list (y/n)	Yes
<i>Optional</i> If the method for accounting Lower Income Residential Demands has been included, provide page number where this accounting can be found.	Section 4.5
<b>DWR NOTES:</b> Additional guidance is provided in Appendix K.	
<b>NOTES:</b>	

Table 4-5 R

<b>Submittal Table 4-5 Retail: Water Loss Audit Reporting</b> <b>Water Code Section 10631(d)(3)(A)</b>		
<b>Public Water System ID # Reported</b> <b>in Table 2-1 R</b>	<b>Reporting Period</b>	<b>Submitted to DWR Water</b> <b>Loss Audit Program (yes/no)</b>
<b>Report submittal status for all five years for each Public Water System as available.</b> <b>Add rows as needed</b>		
CA3410008	<b>2020</b>	Yes
	<b>2021</b>	Yes
	<b>2022</b>	Yes
	<b>2023</b>	Yes
	<b>2024</b>	Yes
<b>DWR NOTES:</b> Suppliers will provide a link to the WUEdata submittals of their Water Loss Audit Reports.		
<b>NOTES:</b>		

Table 4-6 R

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard Water Code Section 10631(d)(3)(C)											
Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System? (y/n) If no, Supplier will not complete this row.	Real Water Loss					Apparent Water Loss				
		State Water Board Standard		Most Recent AWWA Water Loss Audit			State Water Board Standard		Most Recent AWWA Water Loss Audit		
		2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss <small>Drop down list</small>	Number of Units (Connections or Miles corresponding with units selected)	Volume of Total Real Loss (from AWWA Water Loss Audit) (AF)	Real Water Loss Per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit) (AF)	Apparent Water Loss Per Unit per Day
Add additional rows as needed.											
CA3410008	Yes	15.31562462	Gallons per Service Connection per Day (GPSCD)	7999	161	18.0	6.604996058	Gallons per Service Connection per Day (GPSCD)	7999	99	11.1
<a href="#">Water Board's Calculated Water Loss Standards</a>											
DWR NOTES: Units of measure (AF, CCF, MG) for Water Loss <b>MUST</b> remain consistent with units reported in Submittal Table 2-3. The units reported in Submittal Table 2-3 are used in this table's calculations.											
NOTES:											

Table 5-1 R

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress Water Code Section 10608.40						
<input type="checkbox"/>	Check the box if the Supplier was not an Urban Water Supplier during or before the 2020 UWMP reporting cycle. Proceed to the next table.					
Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target? Drop down list	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Only for suppliers that did not meet the Target in 2020 See DWR NOTES below.	
					Actual 2025 GPCD (From SB X7-7 Compliance Form)	Did Supplier meet the 2020 Target in 2025?
No	Individual Target	191	137	Yes		NA
<b>DWR NOTES:</b> Suppliers calculating a 2025 GPCD will need to complete and submit SB X 7-7 Compliance Tables to verify the use of SB X7-7 Methodologies. Suppliers that were part of a merger or consolidation since 2020 see Chapter 5 and Appendix P for guidance. NA=Not Applicable						
<b>NOTES:</b>						

Table 6-1 R

<b>Submittal Table 6-1 Retail: Groundwater Volume Pumped</b> <b>Water Code Section 10631(4) and 10631(4)(c)</b>							
<input type="checkbox"/>	Check the box if the Supplier does not pump groundwater. Proceed to the next table.						
<input type="checkbox"/>	Check the box if all or part of the groundwater described below is desalinated. (OPTIONAL)						
Groundwater Type <b>Drop Down List</b> May use each category multiple times	Potable or Non-Potable (OPTIONAL) <b>Drop down list</b>	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
<b>Add additional rows as needed</b>							
Alluvial Basin	Potable	South American Subbasin	4317	4200	4015	4247	4213
<b>Total</b>			4,317	4,200	4,015	4,247	4,213
<b>DWR NOTES:</b> <b>Units of measure (AF, CCF, MG)</b> must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.							
<b>NOTES</b>							

Table 6-2 R

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area Water Code Section 10633(a)				
<input type="checkbox"/>		Check the box if there is no wastewater collection system. Proceed to the next table.		
		Percentage of 2025 service area served by wastewater collection system (OPTIONAL)		
		Percentage of 2025 service area population served by wastewater collection system (OPTIONAL)		
Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? OPTIONAL Drop Down List	Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Name of Wastewater Treatment Plant (WWTP) and Place ID Number Drop down list	Is WWTP Located Within UWMP Area? Drop Down List
Add additional rows as needed				
Sacramento Area Sewer District	Estimated	3,240	EchoWater Resource Recovery Facility, Place ID 254981	No
<b>Total Wastewater Received from UWMP Service Area in 2025:</b>		3,240		
<b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.</b> <b>Additional Guidance:</b> See Appendix M, Section M.21 for detailed guidance on this table.				
<b>NOTES: Wastewater is estimated based on annual indoor water use.</b>				

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



Table 6-4 R

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area										
Water Code Section 10633 (c),(d),(e)										
<input checked="" type="checkbox"/>		Check box if recycled water is not used and is not planned for use within the service area of the supplier. The supplier will only complete the column on "Potential Recycled Water Use" and submit an accompanying narrative on the feasibility of that potential recycled water use.								
Name(s) of Facility/ies Producing (Treating) the Recycled Water (OPTIONAL) :										
Name of Supplier Operating the Recycled Water Distribution System (OPTIONAL) :										
Volume of Supplemental Water Added in 2025 (OPTIONAL) :										
Source of 2025 Supplemental Water (OPTIONAL) :										
Use Type Drop down list	Potable or Non-Potable (after treatment if treated) (OPTIONAL) Drop down list	Additional Information (as needed)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use	
									Volume	Narrative page number (OPTIONAL)
Add additional rows as needed										
Subtotal Potable			0	0	0	0	0	0	0	
Subtotal Non-Potable			0	0	0	0	0	0	0	
<b>Total</b>			0	0	0	0	0	0	0	0
<p><b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.</b></p> <p><b>Additional Guidance:</b> See Appendix M, Section M.21 for detailed guidance on this table.</p> <p><b>Potential recycled water use:</b> a description of the feasibility of these uses must be included in the narrative.</p> <p><b>Multiple Producers:</b> If you have multiple recycled water producers, submit a separate table for each.</p>										
NOTES:										

Table 6-5 R

<b>Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual</b> <b>Water Code Section 10633(e)</b>		
<input checked="" type="checkbox"/>	Check the box if recycled water was not used in 2025 nor previously projected for use in 2020. Proceed to the next table.	
<b>Use Type</b> Drop Down list	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Add additional rows as needed		
<b>Total</b>	0	0
<b>DWR NOTES:</b> Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3 <b>Additional Guidance:</b> See Appendix M, Section M.21 for detailed guidance on this table.		
<b>NOTES:</b>		

Table 6-6 R

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use Water Code Section 10633(f)			
<input checked="" type="checkbox"/>	Check the box if the Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 3.4.1	Provide page location of narrative in the UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
Add additional rows as needed			
<b>Total (AF)</b>			0
<b>Unit Conversion to AF</b>			0
<p><b>DWR NOTES:</b>  <b>Units of measure</b> (AF, CCF, MG) MUST remain consistent with units reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.  <b>The unit conversion to Acre Feet</b> addresses the Water Code's requirement that this value be provided in acre-feet.</p>			
<b>NOTES:</b>			

Table 6-7 R

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs Water Code Section 10631(f)							
<input checked="" type="checkbox"/>		Check the box if there are no expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Proceed to the next table.					
<input type="checkbox"/>		Check the box if some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
		Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Additional Description (as needed)	Potable or Non-Potable (after treatment if treated) (OPTIONAL) Drop Down list	Planned Implementation Year	Planned for Use in Year Type Drop Down List	Expected Increase in Water Supply to Supplier (This may be a range) (AF)
	Drop Down List (yes/no)	If Yes, Supplier Name					
Add additional rows as needed							
<b>DWR NOTES:</b> Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3.							
<b>NOTES:</b>							

Table 6-8 R

Submittal Table 6-8 Retail: Water Supplies — Actual Water Code Section 10631(b)				
Water Supply	Additional Description (as needed)	2025		
<b>Drop down list</b> May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		<b>Potable or Non-Potable</b> (after treatment if treated) (OPTIONAL) Drop Down list	Actual Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)
Add additional rows as needed				
Groundwater (not desalinated)	EGWD wells	Potable	4,213	
Purchased or Imported Water	SCWA	Potable	2,449	
		Subtotal Potable	6,662	0
		Subtotal Non-Potable	0	0
		<b>Total</b>	6,662	0
<b>DWR NOTES:</b> <b>Units of measure (AF, CCF, MG)</b> must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3. <b>Total Entitlement:</b> e.g. Water Right, Groundwater Allocation, Contracted Amount.				
<b>NOTES:</b>				



Table 7-2 R

<b>Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison Water Code Section 10635 (a)</b>					
	<b>2030 (AF)</b>	<b>2035 (AF)</b>	<b>2040 (AF)</b>	<b>2045 (AF)</b>	<b>2050 (AF)</b>
Supply totals (autofill from Submittal Table 6-9 R)	13,000	13,000	13,000	13,000	13,000
Use totals (autofill from Submittal Table 4-2 R)	6,860	7,205	7,217	7,245	7,286
Surplus/(shortfall)	6,140	5,795	5,783	5,755	5,714
<b>OPTIONAL Planned WSCP Actions</b>					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
<b>DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.</b>					
<b>NOTES:</b>					

Table 7-3 R

<b>Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison Water Code Section 10635(a)</b>					
	<b>2030 (AF)</b>	<b>2035 (AF)</b>	<b>2040 (AF)</b>	<b>2045 (AF)</b>	<b>2050 (AF)</b>
Supply totals	13,000	13,000	13,000	13,000	13,000
Use totals	7,204	7,565	7,578	7,607	7,650
Surplus/(shortfall)	5,796	5,435	5,422	5,393	5,350
<b>OPTIONAL Planned WSCP Actions</b>					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
<b>DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.</b>					
NOTES					

Table 7-4 R

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison Water Code Section 10635(a)						
		2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	13,000	13,000	13,000	13,000	13,000
	Use totals	7,204	7,565	7,578	7,607	7,650
	Surplus/(shortfall)	5,796	5,435	5,422	5,393	5,350
	<b>OPTIONAL Planned WSCP Actions</b>					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Second year	Supply totals	13,000	13,000	13,000	13,000	13,000
	Use totals	7,276	7,568	7,584	7,616	7,659
	Surplus/(shortfall)	5,724	5,432	5,416	5,384	5,341
	<b>OPTIONAL WSCP Actions</b>					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Third year	Supply totals	13,000	13,000	13,000	13,000	13,000
	Use totals	7,348	7,570	7,590	7,624	7,676
	Surplus/(shortfall)	5,652	5,430	5,410	5,376	5,324
	<b>OPTIONAL Planned WSCP Actions</b>					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Fourth year	Supply totals	13,000	13,000	13,000	13,000	13,000
	Use totals	7,420	7,573	7,596	7,633	7,684
	Surplus/(shortfall)	5,580	5,427	5,404	5,367	5,316
	<b>OPTIONAL Planned WSCP Actions</b>					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Fifth year	Supply totals	13,000	13,000	13,000	13,000	13,000
	Use totals	7,493	7,576	7,601	7,641	7,684
	Surplus/(shortfall)	5,507	5,424	5,399	5,359	5,316
	<b>OPTIONAL Planned WSCP Actions</b>					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
<b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.</b>						
<b>NOTES:</b>						

Table 7-5 R

<b>Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment Water Code Section 10635(b)(3)</b>	
<b>2026</b>	<b>Total</b>
Total Water Use (AF)	7,018
Total Supplies (AF)	13,000
Surplus/Shortfall w/o WSCP Action	5,982
<b>OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
<b>2027</b>	<b>Total</b>
Total Water Use (AF)	7,065
Total Supplies (AF)	13,000
Surplus/Shortfall w/o WSCP Action	5,935
<b>OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
<b>2028</b>	<b>Total</b>
Total Water Use (AF)	7,111
Total Supplies (AF)	13,000
Surplus/Shortfall w/o WSCP Action	5,889
<b>OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
<b>2029</b>	<b>Total</b>
Total Water Use (AF)	7,157
Total Supplies (AF)	13,000
Surplus/Shortfall w/o WSCP Action	5,843
<b>OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
<b>2030</b>	<b>Total</b>
Total Water Use (AF)	7,204
Total Supplies (AF)	13,000
Surplus/Shortfall w/o WSCP Action	5,796
<b>OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)</b>	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
<b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.</b>	
<b>NOTES:</b>	

Table 8-1

<b>Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels</b> <b>Water Code Section 10632(a)(3)(B)</b>			
<input checked="" type="checkbox"/>	Check the box if the Supplier uses the Standard six levels of water shortage. Proceed to the next table.		
Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		
<b>NOTES:</b>			

Table 8-2 R

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions Water Code Section 10632(a)(4)(A),(C) and (E)				
Yes	Is the Supplier completing this table using the standard six levels? (yes/no)			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier <b>Drop down list</b> These are the only categories that will be accepted by the WUEdata online submittal tool	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (AF)	
Add additional rows as needed				
1	Other Actions (describe)	Percentage	Up to 10%	See WSCP
2	Other Actions (describe)	Percentage	10-20%	See WSCP
3	Other Actions (describe)	Percentage	20-30%	See WSCP
4	Other Actions (describe)	Percentage	30-40%	See WSCP
5	Other Actions (describe)	Percentage	40-50%	See WSCP
6	Other Actions (describe)	Percentage	>50%	See WSCP
<b>DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.</b>				
NOTES:				

Table 8-3 R

Submittal Table 8-3 Retail: Demand Reduction Actions					
Yes	Is the Supplier completing this table using the standard six levels? (yes/no)				
Shortage Level	Demand Reduction Actions <b>Drop down list</b> These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.	How much is this going to reduce the shortage		Additional Explanation or Reference (OPTIONAL)	Penalty, Charge, or Other Enforcement? For Retail Suppliers Only Drop Down List
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (AF)		
Add additional rows as needed					
1	Other	Percentage	up to 10%	Customer – Asked to reduce total water use by 10%.	Yes
1+	Other	Percentage	0-1%	Customer – Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations	Yes
1+	Other	Percentage	0-2%	Customer – Users of construction meters will be monitored for efficient water use.	Yes
1	Other	Percentage	3-8%	Customer – Limit irrigation to three days per week. Asked to voluntarily reduce to two days a week.	Yes
1+	Other	Percentage	0-3%	District – Leak repairs receives higher priority.	Yes
1+	Other	Percentage	3-5%	District – Increase drought awareness through additional public outreach measures that notify public and customers for declared stage, requirements, and available conservation program support.	Yes
1+	Other	Percentage	0-1%	District – Increased monitoring of customer use.	Yes
1+	Other	Percentage	0-3%	District –Accelerate infrastructure repairs and improvements.	Yes
1+	Other	Percentage	0-4%	District – Increased enforcement measures, including fines and charges, for non-compliance with WSCP.	Yes
1	Other	Percentage	0-2%	District - Flushing is prohibited except in the case of an emergency, public health and for essential operations or unless specifically authorized by the District.	Yes
2	Other	Percentage	up to 20%	Customer –Reduce total water use by 20%.	Yes
2	Other	Percentage	0-1%	Customer – Leaking pipes or faulty sprinklers shall be repaired within two working days or less if warranted by the severity of the problem.	Yes
2	Other	Percentage	5-15%	Customer – Irrigation shall be limited to two days per week.	Yes
2+	Other	Percentage	0-1%	Customer – Water use for ornamental ponds and fountains is prohibited. No potable water from EGWD’s system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams.	Yes
2+	Other	Percentage	0-1%	Customer – Water for flow testing and construction purposes from fire hydrants and blow-offs is prohibited.	Yes
2+	Other	Percentage	3-5%	District – Implement water conservation patrols.	Yes
3	Other	Percentage	up to 30%	Customer – Reduce total water use by 30%.	Yes
3+	Other	Percentage	0-1%	Customer – Leaking pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem.	Yes
3+	Other	Percentage	0-1%	Customer – Use of reclaimed water for construction purposes is encouraged. Reclaimed water is not currently available within EGWD’s service area and would have to be obtained elsewhere.	Yes
3+	Other	Percentage	0-2%	Customer – Flushing of sewers and fire hydrants is prohibited except in the case of emergency and for essential operations or unless specifically authorized by EGWD.	Yes
3+	Other	Percentage	0-1%	Customer – Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.	Yes
3	Other	Percentage	15-20%	Customer – Irrigation shall be limited to two days per week (within six-hour block).	Yes
3+	Other	Percentage	0-3%	Customer – Installation of new turf lawn and/or landscape is prohibited.	Yes
3+	Other	Percentage	1-5%	District – No commitments will be made to provide service for new water service connections unless the DWR MWELO is followed, and the plans have been approved by the appropriate building department(s).	Yes
4	Other	Percentage	Up to 40%	Customer – Reduce total water use by 40%	Yes
4	Other	Percentage	20-30%	Customer – Irrigation is allowed only once per week (within six-hour block).	Yes
4	Other	Percentage	0-2%	Customer – No potable water from EGWD’s system shall be used for construction purposes including but not limited to dust control, compaction or trench jetting.	Yes
4	Other	Percentage	1-4%	District – Maximum psi at wells and treatment plans will be reduced to 55.	Yes
5	Other	Percentage	Up to 50%	Customer – Reduce total water use more than by 50%.	Yes
5+	Other	Percentage	0-1%	Customer – Leaking customer pipes or faulty sprinklers shall be repaired immediately. Water service will be suspended until repairs are made.	Yes
5	Other	Percentage	25-40%	Customer – Turf irrigation is prohibited.	Yes
5	Other	Percentage	2-4%	District – No new connection will be added to the system.	Yes
5	Other	Percentage	1-4%	District – Maximum system operating pressure will be reduced to 50 psi.	Yes
6	Other	Percentage	up to 50%	Customer – Health and safety use of water only.	Yes
6	Other	Percentage	25-40%	Customer – Landscape irrigation is prohibited.	Yes
6	Other	Percentage	varies	District – Other actions as identified specific to the shortage condition.	Yes
6	Other	Percentage	varies	District – Declare Water Shortage Emergency in accordance with Section 350 of Division 1, Chapter 3 Water Shortage Emergencies of the California Water Code.	Yes

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.

NOTES:

Table 10-1 R

<b>Submittal Table 10-1 Retail: Notification to Cities and Counties                      Water Code Section 10621(b) and 10642</b>		
City Name	60 Day Notice Drop Down (yes/no)	Notice of Public Hearing Drop Down (yes/no)
Add additional rows as needed		
City of Elk Grove	Yes	Yes
County Name Drop Down List	60 Day Notice Drop Down (yes/no)	Notice of Public Hearing Drop Down (yes/no)
Add additional rows as needed		
Sacramento County	Yes	Yes
<b>NOTES:</b>		