

MUNICIPAL SERVICES REVIEW

ALAMEDA LAFCO

COUNTYWIDE MUNICIPAL SERVICES REVIEW ON WATER, WASTEWATER, FLOOD CONTROL, AND STORMWATER SERVICES



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Acronyms and Abbreviations

ABAG	Association of Bay Area Government
ACCWP	Alameda County Clean Water Program
ACFWCD	Alameda County Flood Control and Water Conservation District
ACWD	Alameda County Water District
AFD	Albany Fire Department
Arroyo	Arroyo de la Laguna
AWIA	America's Water Infrastructure Act
BACWA	Bay Area Clean Water Agencies
BARR	Bay Area Regional Reliability
BARWC	Bay Area Recycled Water Coalition
BASMAA	Bay Area Stormwater Management Agencies Association
BMPs	best management practices
BPS	Booster Pump Station
CAFR	Comprehensive Annual Financial Report
Cal Water	California Water Service Company
CAP	Climate Action Plan
CCAP	Community Climate Action Plan
CCTV	closed circuit television
CCWD	Contra Costa Water District
CDPs	Census Designated Places
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CES	Center for Economic Studies
CIP	Capital Improvement Program
CMMS	City's Maintenance Management System
COLs	Chain of Lakes
CPUC	California Public Utilities Commission
CRM	Constituent Relationship Management
CSA	County Service Area
CUWCC	California Urban Water Conservation Council
CVSD	Castro Valley Sanitary District
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DDW	Division of Drinking Water
Delta	Sacramento-San Joaquin Delta
DERWA	DSRSD-EBMUD Recycled Water Authority
DSRSD	Dublin San Ramon Services District
DUCs	Disadvantaged Unincorporated Communities
DWR	Department of Water Resources
DWSRF	Drinking Water State Revolving Loan Fund
EBDA	East Bay Dischargers Authority
EBMUD	East Bay Municipal Utility District
EMSO	El Niño-Southern Oscillation

EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
ERPs	emergency response plans
ESS	Environmental Services Section
FEMA	Federal Emergency Management Agency
FOG	fats, oils and grease
FSE	food service establishments
FSRS	Fire Suppression Rating Schedule
GHG	greenhouse gas
GI	Green Infrastructure
GSA	Groundwater Sustainability Agency
GSPs	Groundwater Sustainability Plans
IPR	indirect potable reuse
IRP	Integrated Resources Plan
IRWMP	Integrated Regional Water Management Plan
ISO	Insurance Services Office
LADWP	Los Angeles Department of Water and Power
LAFCOs	Local Agency Formation Commissions
LAVWMA	Livermore Amador Valley Water Management Agency
LBNL	Lawrence Berkeley National Laboratory
LVVWD	Las Vegas Valley Water District
MAUVE	maintenance and ultra-violet electrical
MCL	Maximum Contaminant Level
mgd	million gallons per day
MOA	Memorandum of Agreement
MRP	Municipal Regional Permit
MS4s	municipal separate storm sewer systems
MSR	Municipal Service Review
MTC	Metropolitan Transportation Commission
NIMS	National Incident Management System
NPDES	National Pollutant Discharge Elimination System
OLSD	Oro Loma Sanitary District
OWTS	onsite wastewater treatment systems
PDO	Pacific Decadal Oscillation
PFAS	polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PPC	Public Protection Classification
RWQCB	Regional Water Quality Control Board
RWTF	recycled water treatment facility
SCADA	Supervisory Control and Data Acquisition
SDRP	Spill and Discharge Response Plan
SDWA	Safe Drinking Water Act
SEMS	Standardized Emergency Management System
SFPUC	San Francisco Public Utility Commission

SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SGMA	Sustainable Groundwater Management Act
SMMP	Stream Management Master Plan
SOI	Sphere of Influence
SRVRWP	San Ramon Valley Recycled Water Program
SSOs	sanitary sewer overflows
SSS	Sanitary sewer systems
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	Thousand Acre-Feet
TMDLs	Total Maximum Daily Loads
TTCD	Total Trash Capture Device
UCB	University of California at Berkeley
UGB	Urban Growth Boundary
USD	Union Sanitary District
USGS	U.S. Geological Survey
UV	ultraviolet
UWMP	Urban Water Management Planning
VCP	vitriified clay pipe
VMP	Vegetation Management Plan
WDRs	waste discharge requirements
WRWC	Western Recycled Water Coalition
WSIP	Water System Improvement Program
WSMP	Water Supply Management Program
WTHCD	Washington Township Health Care District
WTPs	water treatment plants
WWTP	Wastewater Treatment Plant
Zone 7	Zone 7 Water Agency

EXECUTIVE SUMMARY

A Municipal Service Review (MSR) is a State-required comprehensive study of services within a designated geographic area, in this case, Alameda County. The MSR requirement is codified in the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (Government Code Section 56000 et seq.), which took effect on January 1, 2001.

MSRs are required before a Local Agency Formation Commission (LAFCO) creates or updates spheres of influence (SOIs) for public agencies. LAFCO only reviews services provided by public agencies that have, or are required to have, SOIs. The cities and special districts providing utility services, including water, wastewater, flood control, and stormwater, within the boundaries of Alameda County are the focus of the review. Other public and private providers offering the same or similar services in the County, which are not subject to LAFCO review, are discussed where appropriate.

This MSR contains general information regarding land use, service provider, and population data used to support analyses and conclusions. State-required evaluations of nine specific service evaluation categories are also included. Service issues are evaluated, and practices are compared with consideration for local conditions, circumstances, and resources. Government structure options, such as mergers or consolidations that might enhance government functions, are identified. MSR options, conclusions, and recommendations are used by LAFCO when rendering the State-required MSR determinations.

Purpose

The report and the data collected through the service review process will be used by LAFCO to review the services provided by cities and special districts. This report will be used to analyze the water, wastewater, flood control, and stormwater services provided by 10 special districts engaged in utility services and 14 cities. LAFCO will use this information along with that gathered in the previously submitted public safety MSR and a subsequent service review relating to these agencies.

Government Code §56375(a) gives LAFCO the power to initiate certain types of boundary changes consistent with service reviews and SOI studies. These boundary changes include:

- Consolidation of districts (joining two or more into a single successor district).
- Dissolution (termination of a district and its corporate powers).
- Merger (termination of a district by merging that district with a city).
- Establishment of a subsidiary district (where a city council becomes the board of directors of the district).
- A reorganization that includes any of the above.

Any local agency may apply to LAFCO for a boundary change. This applies to cities and special districts that contain or will contain (or whose SOI contains) any territory to be reviewed by LAFCO and the County. Registered voters or property owners within the proposed area may

petition LAFCO for a boundary change. The following types of boundary changes may be proposed to LAFCO:

- Formation of a new district or city.
- Annexation to or detachment from a city or district.
- A reorganization that includes any of the above.

LAFCO may also use the information presented in the MSR to review future proposals for extension of service beyond an agency's jurisdictional boundaries or for amendment of urban service area boundaries of a city.

Data Sources

The local agencies/districts providing utility services have provided a substantial portion of the information included in this report. Each local agency/district provided budgets, financial statements, bonded debt statements, and various plans. Their assistance and cooperation have been invaluable.

In order to minimize the burden on the agencies and maximize the comparability of the data across providers, the report relies whenever possible on standard, central data sources, including the Alameda Countywide Clean Water Program, the Alameda County Waste Management Authority, Association of Bay Area Governments, the California Water Quality Control Board, the California Department of Health Services, the California Department of Water Resources, the Integrated Waste Management Board, the State Controller, U.S. Environmental Protection Agency, U.S. Census Bureau, U.S. Department of Agriculture, and the following Alameda County departments: Registrar of Voters, Auditor/Controller, Assessor, Public Works, Environmental Health, Surveyor, and Information Technology.

The data in this report reflect best efforts. Some data were unavailable. Much of the data used represents a snapshot in time and may not reflect a long-term trend or average. For a more detailed listing of data sources, please refer to the references section.

Recommendations

The following recommendations call for specific action either from Alameda LAFCO and/or from one or more of the affected agencies based on information as part of this report and outlined below. Recommendations for Commission action are dependent on a subsequent directive from the membership through the adopted work plan.

1. Alameda LAFCO should create a Countywide Regional Water and Wastewater Committee that includes all affected agencies that provide water, wastewater, stormwater, and flood control services to explore opportunities and to share practices for collaboration on how the region can recycle water, or better utilize water that is already imported, so it is not only used once and discarded into the Bay. The Committee should also explore the costs and effectiveness of a regional desalination plant.

2. The City of Oakland should create a Sewer Master Plan and provide a report to LAFCO once that plan has been completed.
3. Alameda LAFCO, in coordination with the Sunol Citizens Advisory Committee, should discuss wastewater feasibility to the unincorporated community of Sunol.
4. Alameda LAFCO and the City of Pleasanton should continue their coordination on producing a feasibility study for wastewater services to the unincorporated community of Remen Tract.
5. The Castlewood Services CSA should update its Water Master Plan and provide a report to Alameda LAFCO once completed.
6. The ACCWP and its member agencies should investigate proper financing measures to repair and maintain their corresponding systems. By doing so, all agencies would be prepared for various flooding events as well as be more equipped to deal with climate change impacts.
7. Treatment plant operating agencies should coordinate with their partner cities' public works departments in order to prevent roadways and other rights of way from being excavated multiple times to maintain conveyance infrastructure.

Determinations

The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 requires LAFCO to prepare Municipal Service Reviews. Part of that process is the adoption of written determinations for nine specific evaluation categories as enumerated in Government Code §56430.

A determination is a declaratory statement or conclusion based on the information and evidence presented to LAFCO in the administrative record. These determinations are supported by evidence in the record of the service review proceedings, including all the information collected, LAFCO's analysis and interpretation of the information, oral and written information presented by the public, and oral and written testimony given at public hearings.

Determinations included in this Executive Summary are based on information compiled and analyzed in this MSR.

Summary of Determinations

GROWTH AND POPULATION

- The residential population of Alameda County is projected to grow 22 percent between 2020 and 2040 to a population of about 2.1 million.
- About 45 percent of the new residential growth is projected to occur in the City of Oakland. Fremont, Dublin, Emeryville, and Hayward are also projected to increase more than other cities or the unincorporated area.

- The daytime population of Alameda County does not change significantly. Pleasanton, Berkeley, and Emeryville see the greatest increase between residential and daytime populations. Emeryville has the greatest percentage increase in population during the day.
- The number of jobs in Alameda County is projected to increase from approximately 859,000 in 2020 to 953,000 in 2040.
- Job growth is projected to be highest in Oakland, Fremont, Pleasanton, and Dublin.
- Land decisions are under the jurisdiction of Alameda County in the unincorporated areas and the 14 cities within their respective city limits. Most jurisdictions have urban growth boundaries that direct growth to already urbanized areas and promote infill development, higher densities, and better access to public transit. Such policies help reduce the need to expand utility service lines into new areas and instead make full use of existing infrastructure.

DISADVANTAGED UNINCORPORATED COMMUNITIES

- Alameda LAFCO has adopted a policy that states that disadvantaged unincorporated communities should be identified only by using census designated places (CDPs).
- The unincorporated community of Ashland is the only CDP with a median income that would qualify it to be considered a disadvantaged unincorporated community. However, the community is already being provided with water, sewer, and flood control services by EBMUD, OLSD, and ACFWCD, respectively, so no changes to spheres of influence are recommended based on its potential DUC status.

WATER SERVICES

- There are four special districts engaged in water services in Alameda County: Alameda County Water District (ACWD), Dublin San Ramon Services District (DSRSD), East Bay Municipal Utility District (EBMUD), and the Zone 7 Water Agency.
- There are four multipurpose agencies that provide water services in Alameda County: Castlewood County Service Area and the cities of Hayward, Pleasanton, and Livermore.
- For emergency sharing of potable water, several of the agencies have interties, including EBMUD with DSRSD, Costa Contra Water District, and City of Hayward; ACWD and cities of Milpitas and Hayward; DSRSD with cities of Pleasanton and Livermore; and City of Livermore with California Water Service Company.
- The City of Livermore and DERWA, a joint powers authority between DSRSD and EBMUD, provides recycled water.

- Urban water demand is primarily affected by population and economic growth and by water use efficiency. Population and economic growth lead to greater water use.
- In the past, some jurisdictions would increase water rates as a technique to promote conservation, under the assumption that water use levels change in response to changes in water prices, improvements in the efficiency of plumbing fixtures, and conservation programs. However, as the result of a 2015 court case, water agencies can no longer have tiered water rates to encourage water conservation, and agencies can only set rates based on the cost to provide the service.
- Most of the potable water in Alameda County is imported surface water. The primary sources of potable water in Alameda County are through the Mokelumne River and the State Water Project.
- As a result of the restrictions in the Delta, the concerns with water quality, and the variability of imported water supplies due to climate change, the agencies in the Bay Area and Alameda County are exploring more diversified water supply portfolios and looking to regional and local supplies such as recycled water and desalination.
- Retail water providers store smaller quantities of potable water as reserves. On average, the water retailers, ACWD, Cal Water, DSRSD, and the cities of Hayward, Livermore, and Pleasanton have enough storage capacity to accommodate the average daily water demand for at least 1.5 days. DSRSD is able to accommodate the average daily demand for the least amount of time, 1.5 days, as the agency's storage capacity is 42.3 million gallons per day, and the average daily demand is 27.5 million gallons per day.
- Municipal water providers practice extensive facility sharing and regional collaboration. The water systems throughout the region are interconnected. Providers receiving water supplies from a common source share storage and conveyance facilities. Emergency interties connect neighboring providers with backup supplies. Multiagency cooperation is common practice for planning efforts, emergency preparedness, and recycled water provision.
- The Bay Area's five largest water agencies, the Contra Costa Water District, EBMUD, SFPUC, the Santa Clara Valley Water District, and Zone 7, are jointly exploring a regional desalination project that would provide an additional water source, diversify the area's water supply, and foster long-term regional sustainability. The main goal is to locate a 10 to 20 million gallons per day desalination treatment facility in eastern Contra Costa County to turn brackish water into a reliable, drought-tolerant drinking water supply. EBMUD's current role in the regional desalination plan is limited to potentiality wheeling water for the Bay Area agencies that are evaluating the project.
- Every major water provider has a drought preparedness plan and storage options were a drought to occur. With the recent severe drought from 2011 to 2019 (mostly

from 2014 to 2017), water agencies were forced to enact their drought preparedness programs.

- Water service charges, connection fees, property tax, assessments, and voter-approved measures are significant revenue sources for water enterprises in Alameda County. There is a basic difference in how single service and multiservice agencies collect funds for water enterprises. Multiservice agencies are able to split overhead costs within their rates of multiple municipal services in order to provide lower overall costs for water services, whereas single service agencies must include all overhead within the rate for water service.

WASTEWATER SERVICES

- Wastewater collection service is available in most of the developed areas of the County through the municipal wastewater systems of the providers listed (see Figure 5-1). Areas that do not have a municipal wastewater system, but may have wastewater services through a district, include Sunol, Hayward Marsh areas, Union City, ridge areas between and within Pleasanton and Hayward, canyons north of Castro Valley, and sparsely developed areas in eastern Alameda County.
- Five special districts provide services exclusive to utility services. Those service providers are Castro Valley Sanitary District, Dublin San Ramon Services District, East Bay Municipal Utility District, Oro Loma Sanitary District, and Union Sanitary District.
- There are 15 multipurpose agencies engaged in wastewater services in Alameda County. Three agencies provide wastewater collection and a portion of treatment services, while the other 12 agencies have contracted with a limited purpose agency to receive collection and/or treatment services.
- The cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont operate wastewater collection systems and rely on EBMUD for wastewater treatment and disposal. All of these cities' service areas are coterminous with their bounds, except Berkeley serves areas outside its bounds, as discussed below.
- Wastewater demand is primarily affected by population and economic growth, water use efficiency, infiltration and inflow, and loading factors. Many innovations have been made to reduce the rapid increase in wastewater demand. Water-efficient plumbing fixtures reduce the amount of wastewater. Low-flow toilets and washing machines can significantly reduce the demand for expanded wastewater services.
- Each wastewater treatment facility has adequate capacity to accommodate their average daily flow of influent with available capacity to accommodate near-term growth.
- Municipal wastewater providers practice extensive facility sharing. Examples include shared wastewater pipelines, shared treatment and reclamation facilities, and the

DSRSD-EBMUD Recycled Water Authority (DERWA), which is a joint powers agreement established with the purpose of creating a recycled water program to reduce the total amount of wastewater.

- To improve collection system integrity, all sewer service providers in Alameda County conduct some level of closed-circuit television (CCTV) inspection of sewer lines, although the rate of inspections varies by agency.
- Almost 80 percent of all revenues for these agencies comes from sewer collection fees. The average rate of the service providers is about \$36.64 for single-family residential use. Most of the rates are flat in nature and do not fluctuate based on more usage by the user. Some rates include both collection and treatment services, while some are charged for only one of these services.
- Commercial and industrial rates vary by the type of business or operation, which dictates the type of treatment ultimately needed and provided to the customer. As uses intensify in the wastewater generated, costs increase as more impacts are made to the conveyance systems and/or more treatment is required. The operators of wastewater treatment or water reclamation plants each offer rates for separate and/or individual users who haul wastewater and other organic wastes, which can be treated at their plants.
- Each sewer service provider has established a reserve fund to ensure solvency. Wastewater service providers have remained consistent with keeping up with inflation and updating rates as needed to prevent any sort of deficit or gap in service funding for customers. All agencies charge rates that are based on wastewater generated by different individual uses.
- All the wastewater service agencies practice proper dissemination of information by putting their budgets, agenda, and other general business documents on their websites.

FLOOD CONTROL SERVICES

- The Alameda County Flood Control and Water Conservation District (ACFWCD) is the primary flood control service provider in Alameda County and is governed by the County Board of Supervisors. The ACFWCD flood control system is an integrated part of local stormwater systems built and managed by the cities and functions as an extension of the local cities' stormwater systems. City stormwater systems drain in various fashions, in some cases directly into ACFWCD channels and in other cases through local creeks and into the San Francisco Bay. The ACFWCD is divided into 10 zones.
- Zone 7 of the ACFWCD provides flood control service to the eastern part of the County, including the cities of Dublin, Livermore, and Pleasanton. Zone 7 is a quasi-

independent district. Zone 7 has an independently elected board that has sole authority to govern matters relating only to Zone 7.

- The cities of Alameda, Albany, Berkeley, and Piedmont provide their own integrated drainage services, including both stormwater and flood control functions. These cities are responsible for urban stormwater collection and substreet infrastructure.
- Flood control service demand is determined by factors such as precipitation levels and intensity, impervious surfaces, topography affecting the amount of runoff, and the prevalence of development in flood-prone areas. Precipitation amounts are not controllable, but proper planning can minimize flooding hazards and reduce service needs based on annual rainfall amounts.
- A major factor influencing flood service demand is the amount of precipitation in the flood service area. This includes amount of rainfall, intensity of rainfall, and duration of storm events. Flood-prone areas in Alameda County are small when compared to other counties. Most are located along the western edge of the County boundary.
- To manage and control erosion, the ACFWCD and Zone 7 are subject to regulatory requirements for stormwater pollution control requirements on commercial and construction activities, which include grading, clearing, excavation, or other earth-moving activities. The land use permitting agencies are responsible for carrying out the pollution control requirements in the unincorporated areas of the County.
- Zone 7 is currently addressing increased stormwater runoff caused by new construction and paving through planned capital improvements and runoff reduction measures.
- The flood control system throughout the County is interconnected, and multiagency cooperation is important for providing service. Both the ACFWCD and Zone 7 share in regulatory compliance costs through participation in the Alameda Countywide Clean Water Program.
- The ACFWCD engages in extensive staff sharing. The District is staffed by the Alameda County Public Works Department, which maintains other County facilities.
- Both the ACFWCD and Zone 7 have strategies to combat excessive inflow and infiltration. Combating excessive water from entering the system is essentially diverting water away from the system or slowing down the rate in which the water enters the system. Green Infrastructure (GI) implementation, such as use of landscape swales, is a popular, eco-friendly strategy.
- According to the Zone 7 Stream Management Master Plan (SMMP), the two main needs pertaining to flood control are the assessment of the flooding potential along the Valley's streams and arroyos resulting from a 100-year flood event and sediment deposition throughout the watershed.

- Approximately 81 percent of all revenues for flood control services comes from property tax or assessments, general fund allocations, or intergovernmental transfers.
- All the cities providing flood control services utilize general fund allocations, which may allow for fluctuation of revenues for this service due to these funds being able to be used for other services. An exception is the City of Berkeley, which has a property-based special assessment that helps fund flood control services.
- The ACFWCD management practices include benchmarking, financial audits, and performance evaluation. To monitor productivity within the District, its engineers develop labor cost estimates and project schedules for each project. The labor costs and project schedules are monitored monthly. Workload is also monitored through monthly work assignment status updates. Alameda County adopted a Capital Improvement Plan in FY 2019-2020 with a time horizon of five years.
- Zone 7 has adopted planning documents on flood control service issues, including a Capital Improvement Plan in FY 2018-2019 with a time horizon of 10 years and a Stream Management Master Plan in 2006 that addresses several long-term service issues. Zone 7 management practices include financial audits and performance evaluation.

STORMWATER SERVICES

- Stormwater services within Alameda County are typically handled by each municipality and by the Alameda County Flood Control and Water Conservation District in unincorporated areas.
- In Alameda County, all the municipalities and the Flood Control District have joined together in the Alameda Countywide Clean Water Program (ACCWP) and are regulated by the RWQCB San Francisco Region. These agencies and municipalities within Alameda County are Alameda County, Alameda County Flood Control and Water Conservation District, cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City, and Zone 7 Water Agency.
- Each agency is responsible for service within its boundary area. None of the agencies provide stormwater services outside their respective territory.
- A major driving factor affecting the capacity and utilization of stormwater facilities in Alameda County is the rate of precipitation. While precipitation amounts cannot be controlled, proper facilities can be managed when service needs can be determined upon annual rainfall amounts and seasonal heavy rainfalls.

- Stormwater service needs are also affected by pollutant loads in stormwater runoff and emerging regulatory requirements, including total maximum daily load requirements for reducing pollutants to the maximum extent practicable.
- Over the next 15 years, stormwater service demand will likely increase to keep pace with growth in development (impervious areas) and regulatory requirements. Factors that affect stormwater service demand include the amount of rainfall, new development of storm drains and other stormwater infrastructure, development controls, as well as increased commercial and industrial growth.
- While most cities have facilities that are in fair to good condition, some cities such as Berkeley, Emeryville, and Oakland have systems that are either very old or cannot handle the necessary capacity.
- All the stormwater service providers participate in the ACCWP, which coordinates the implementation of service activities and standards to combat stormwater pollution, develops regional programs that address both federal and State requirements, and fosters regional awareness of watershed and environmental priorities.
- The State Water Resources Control Board reports that the cities of Alameda and Oakland have had the most enforcement action and violations in the last five reporting years. Other agencies have minimal amounts.
- Each agency is responsible for providing an inspection program to curb illegal discharges, and BMPs have been developed to perform this activity effectively. The goal for agencies is to inspect high-priority areas at least once per year and survey each agency's entire drainage area within a five-year period.
- All the cities have active street sweeping, storm drain inspection, and litter control programs as required by the NPDES permit and monitor these activities through performance tracking.
- All agencies maintain illegal dumping prevention programs, some of which are stencils of "no dumping" on storm drains and public information and outreach. Illegal dumping enforcement is carried out through local agency response to spills and reports of illegal dumping.
- Approximately 80 percent of all revenues for these agencies comes from property tax or assessments and intergovernmental transfers. Property taxes are subject to State constitutional limits established under Proposition 13. Property assessments are established through the Proposition 218 process and accompanied by some sort of engineering study, which establishes an assessment for a specific purpose to be levied to property owners. The primary financing restrictions of public agencies are the limitations associated with rate increases and compliance with Proposition 218. Storm drainage agencies do not maintain actual rates to customers for direct service.

- The ACCWP, of which all the aforementioned agencies are members, establishes the best management practices for all the agencies to operate in regard to storm drainage. The ACCWP facilitates local compliance with the Federal Clean Water Act, coordinating its activities with other pollution prevention programs, such as wastewater treatment plants, hazardous waste disposal, and water recycling. The ACCWP also works with public agencies from around the County to foster a culture of stewardship, educating residents and businesses alike on how to prevent stormwater pollution.
- The ACCWP sets standard rules of operation for all the storm drainage agencies within Alameda County. By utilizing the same management practices, all agencies can be evaluated evenly for performance.
- The ACCWP and its member agencies should investigate proper financing measures to repair and maintain their corresponding systems. By doing so, all agencies would be prepared for various flooding events as well as be more equipped to deal with climate change impacts.

AGENCY SUSTAINABILITY AND RESILIENCY

- Climate models have predicted an increase in warming throughout the 21st century, with average annual air temperature increasing about two degrees to five degrees by 2050.
- Warmer temperatures, altered patterns of precipitation and runoff, and rising sea levels are increasingly compromising the ability to effectively manage water supplies, floods, and other natural resources.
- The San Francisco Bay Area's Integrated Regional Water Management Plan (IRWMP) outlines the region's water resources management needs and objectives and presents innovative strategies and important actions to help achieve specific objectives regarding climate change. The IRWMP identifies ongoing regional needs and issues. This document includes many agencies in the Bay Area, including those in Alameda County.
- Alameda County's adopted GHG emissions reduction target of 15 percent below 2005 baseline emission levels by 2020 is consistent with the recommendation contained within the State's Climate Change Scoping Plan. Most of the policies aim to slow or reduce County contributions to climate change through reductions in water consumption, greenhouse gas emission, and energy consumption. Indirectly, the reduction in water consumption practices can be viewed as resiliency planning of sorts as it preserves the finite resource in the event it becomes scarcer over time.
- Alameda County Water District's Urban Water Management Plan identifies that some of its sources may be specifically impacted by climate change. For example, the inclusion of the State Water Project water supply allocation projects in District

supplies accounted for early effects of climate change and sea-level rise for future operating conditions.

- The City of Albany has addressed sustainability through the Conservation and Sustainability Element of the General Plan. The General Plan supports shoreline restoration, waterfront recreational improvements, and strategies to improve resilience and adaptation as sea-level rises. Albany has policies related to working collaboratively with surrounding jurisdictions and regional agencies on adaptation planning for rising sea-level along the Albany shoreline, including any future reuse plans for Golden Gate Fields. Furthermore, the City works to ensure that proposed land uses and capital improvement decisions for the shoreline area consider long-term sea-level projections.
- The City of Alameda's Sanitary Sewer Master Plan states that as the City continues to rehabilitate and replace sanitary sewers and property owners replace their private service laterals, these changes are not expected to result in any further capacity issues in the Alameda sewer system.
- The City of Berkeley adopted a Climate Action Plan (CAP) in 2009 to review and address the need to adopt climate change adaptation policies. These policies include launching and sustaining a collaborative process for increasing Berkeley's and the region's preparedness for climate change impacts, encouraging water conservation and efficiency and expanding and diversifying the water supply, partnering with local, regional, and State agencies to reduce the property damage associated with flooding and coastal erosion, and increasing urban tree cover to prepare for more extreme heat events.
- The City of Dublin's Climate Action Plan 2030 and Beyond (CAP), adopted in September 2020, establishes Dublin's vision to reach carbon neutrality to reduce greenhouse gas emissions while growing the population and working towards a low carbon economy. The CAP contains five strategies, each with implementation measures that lead Dublin to achieve its CAP goals.
- East Bay Municipal Utility District strives to seek resiliency and plans for the future. Their Board adopted an Urban Water Management Plan and our Water Shortage Contingency Plan that looks to ensure water use into the future.
- Hayward's Climate Action Plan was incorporated into its General Plan in 2014. In 2020, Hayward adopted GHG reduction goals to achieve a 55 percent reduction by 2030 and carbon neutrality by 2045. In 2021, Hayward commenced a CAP update to develop a roadmap to meet the new goals. In addition, Hayward worked with the Hayward Area Shoreline Planning Agency (HASPA) to prepare the Hayward Regional Shoreline Adaptation Master Plan (completed in February 2021) to identify the strategies and projects needed to address sea-level rise.

- The City of Livermore’s Urban Water Management Plan identifies some of the impacts related to water demand and climate change and suggests increasing the use of recycled water.
- The City of Newark’s Climate Action Plan goals and priorities are supported by their General Plan. Policies are incorporated to reduce Newark’s contribution to climate change as well by encouraging transit-oriented development, increasing transportation options, and planning for rising sea levels.
- The City of Oakland has adopted a document referred to as the “resiliency playbook.” The Resilient Oakland playbook is a holistic set of strategies and actions to tackle systemic, interdependent challenges. This includes equitable access to quality education and jobs, housing security, community safety, and vibrant infrastructure, which will better prepare the City for shocks like earthquakes and climate change impacts.
- Oro Loma Sanitary District’s Pipeline Program is well aligned with adaption to climate change. Over the next 10 years, the District will be replacing 1.5 percent/year of its system and will have replaced nearly two-thirds of its collection system with HDPE pipe in the next 50 years. The HDPE piping system is expected to reduce infiltration over time, which will counter the impacts of higher-intensity storms.
- The City of Piedmont has adopted a Natural Resources and Sustainability Element that identifies policies related to sustainability, with an overall goal of reducing water use by 20 percent. The City has also adopted a Climate Action Plan that includes specific adaptation objectives and corresponding action items to specifically deal with minimizing risks from flooding, excessive heat, and other extreme events, such as earthquakes.
- The City of Pleasanton’s Climate Action Plan identifies potential vulnerabilities to the City as a result of climate change while also adopting strategic measures for adaptation. The goals of the City’s CAP include adaptations to the following identified vulnerabilities: public health, water management, agricultural and local food, ecosystems and biodiversity, and energy management.
- The City of San Leandro has adopted a Climate Action Plan that outlines goals covering four basic categories: building energy use, transportation and land use, waste reduction and recycling, and municipal operations. However, it does not appear that the CAP includes specific resiliency or adaptive measures but instead focuses on limiting the City and its residents’ contributions to climate change rather than reacting to its impacts.
- Union City has an adopted Climate Action Plan that identifies specific impacts as a result of climate change and needed adaptation and resiliency measures. These include examining the existing flood water system and determining the resiliency that exists as well as completion of various projects, such as the Salt Ponds Restoration

Project, which aids in absorbing flood waters and slowly releases them back into the Bay.

- The Union Sanitary District addresses items such as sea-level rise in its various assessment documents in order to prevent extreme events from inhibiting District operations.
- Zone 7 Water Agency's Urban Water Management Plan addresses local climate as well as water supply resiliency to determine if adaptive measures or policies need to be implemented in order to ensure service delivery to customers within the service area.
- To provide a resilient water supply in the region in the face of climate change, there should be closer collaboration between water and wastewater agencies to maximize the use of wastewater through water recycling and potable reuse.

SPHERE OF INFLUENCE REVIEW

- All limited purpose special districts evaluated do not appear to require further review of the spheres of influence at this time.
- All cities' recommendations have been excluded from this analysis, except for the City of Pleasanton, who specifically requested an analysis of their SOI with this MSR.
- Alameda LAFCO should consider a request by the City of Pleasanton to revise its Sphere of Influence after it completes its Water Service Master Plan. Analysis of the revised SOI should focus on the City's General Plan Urban Growth Boundary, adopted specific plan areas, planned open space areas, Utility Master Plans, and communities of interest, such as the Castlewood and East Pleasanton areas.

SECTION 1 - INTRODUCTION

1.1 - LAFCO Overview

Under State law, the legislature has exclusive power to regulate local government boundaries, including the power to create and dissolve local agencies and change their boundaries. Local Agency Formation Commissions (LAFCOs) serve as the legislature's watchdog over city and special district boundaries. A LAFCO has been established in each county in California. The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 directs LAFCOs to achieve three main purposes as mentioned in Government Code §56301 (State of California, 2017):

1. Discourage urban sprawl.
2. Encourage orderly governmental boundaries.
3. Preserve open space and prime agricultural lands.

The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (CKH Act) mandates that a Municipal Service Review (MSR) must be conducted prior to or in conjunction with Sphere of Influence (SOI) updates. These reviews are to be conducted in five-year intervals. As part of the MSR, LAFCO must prepare an analysis and written statement of determinations regarding each of the following nine evaluation categories:

- Growth and population projections for the affected area.
- The location and characteristics of any disadvantaged unincorporated communities within or contiguous to the SOI.
- Present and planned capacity of public facilities, adequacy of public services, infrastructure needs or deficiencies, including needs or deficiencies related to treated and industrial water, and structural fire protection in any disadvantaged unincorporated communities within or contiguous to the SOI.
- Financial ability of agencies to provide services.
- Status of and opportunities for shared facilities.
- Accountability for community service needs, including governmental structure and operational efficiencies.
- Any other matter related to effective or efficient service delivery, as required by commission policy.

Alameda LAFCO provides oversight over local governments to make Alameda County a great place to live and work by balancing the preservation of agriculture and open space with the provision of sustainable municipal services.

1.2 - Municipal Service Review Origins

In 1997, the State legislature established the Commission on Local Governance for the 21st Century. The members of this commission include members of various sectors of government as well as constituent groups. The primary purpose of this commission was to

study the local governance issues and make reasonable and appropriate recommendations for making improvements to the governance structure through LAFCOs and the CKH Act. The findings of the commission were made within “Growth Within Bounds,” which was published in January 2000.

The commission stated the following regarding every LAFCO’s oversight role pertaining to service delivery within its jurisdiction:

“Comprehensive knowledge of the services available within its county, the current efficiency of providing service within various areas of the county, future needs for each service, and expansion capacity of each service provider.

Although some LAFCOs may have access to such essentials, many do not, and the Cortese-Knox Act offers no mechanism for assisting and encouraging them to gather the basic necessary information. The commission believes that such provision should be added to the statute.

Information on public service capacity could be gathered as part of the implementation of a new requirement for periodic municipal service reviews. LAFCOs could conduct such reviews prior to or in conjunction with amendments to spheres of influence. A municipal service review would encompass a comprehensive study of each identifiable public service provided by counties, special districts, and the cities in the region.

The review would not focus exclusively on an individual jurisdiction to determine its future boundary or service areas. Rather, it would require LAFCO to look broadly at all agencies within a geographic region that provide a service. The review would also include a component that examines the benefits or disadvantages of consolidation or reorganization of service providers.

LAFCOs should be provided flexibility in designating the geographic area to be analyzed, the timing of conducting particular reviews, and the scope of the reviews.”

The resulting statute additions to CKH were codified following the commission’s findings to create a formal process that could be used to collect information and evaluate service provision from a broader perspective, referred to more commonly as the Municipal Service Review (Office of Planning and Research, 2003).

1.3 - Municipal Service Review Legislation

A Municipal Service Review (MSR) is a comprehensive assessment of the ability of existing local government agencies to effectively and efficiently provide municipal services to residents and users. The form and content of an MSR are specified by requirements in the CKH Act and in the State of California’s Local Agency Formation Commission MSR Guidelines,

published in August 2003 (Office of Planning and Research, 2003). The CKH Act requires LAFCO to review and update SOIs not less than every five years and to review municipal services before updating SOIs. The MSR provides LAFCO with a tool to study existing and future public service conditions comprehensively and to evaluate organizational options for accommodating growth, preventing urban sprawl, and ensuring that critical services are provided efficiently. The CKH Act requires all LAFCOs, including Alameda LAFCO, to prepare an MSR for each of its incorporated cities and its special districts.

It is expected that MSR determinations may be closely followed by LAFCO actions to update various SOIs. A California Environmental Quality Act (CEQA) determination will then be made on a case-by-case basis once the proposed project characteristics are clearly identified. The ultimate outcome of conducting an MSR may result in LAFCO acting on a recommended change of organization or reorganization on its own initiative, at the request of any agency, or in response to a petition.

1.4 - Sphere of Influence Updates

A Sphere of Influence (SOI) or (sphere) is a LAFCO approved plan that designates an agency's probable future boundary change proposals and is intended to encourage the efficient provision of organized community services and prevent duplication of service delivery. Territory cannot be annexed to a city or district unless it is within the agency's SOI. The purpose of SOIs is to ensure the efficient provision of services, to discourage urban sprawl and premature conversion of agricultural and open space lands, and to prevent overlapping jurisdictions and duplication of services.

LAFCO does not regulate land use, dictate how an agency should operate, or set rates. LAFCO can, however, enact policies that indirectly affect land use decisions. On a regional level, LAFCO promotes logical and orderly development of a community through reconciling differences between agency plans so that the most efficient urban service arrangements are created for the benefit of area residents and property owners.

LAFCO may recommend government reorganizations to particular agencies in the county, using the SOIs as the basis for those recommendations. Based on the review of the guidelines and practices of Alameda LAFCO as well as other LAFCOs in the State, six conceptual approaches have been identified from which to choose in designating an SOI.

1. **Coterminous Sphere:** The sphere for a city or special district that is the same as its existing boundaries.
2. **Annexable Sphere:** A sphere larger than the agency's boundaries identifies areas the agency is expected to annex. The annexable area is outside its boundaries and inside the sphere.
3. **Detachable Sphere:** A sphere that is smaller than the agency's boundaries identifies areas the agency is expected to detach. The detachable area is the area within the agency but is not within its sphere.

4. **Zero Sphere:** A zero sphere indicates the affected agency's public service functions should be reassigned to another agency, and the agency should be dissolved or combined with one or more other agencies.
5. **Consolidated Sphere:** A consolidated sphere includes two or more local agencies and indicates the agencies should be consolidated into one agency.
6. **Limited Service Sphere:** A limited service sphere is the territory included within the SOI of a multiservice provider agency that is also within the boundary of a limited purpose district, which provides the same service (e.g., fire protection) but not all needed services. Territory designated as a limited service SOI may be considered for annexation to the multiservice agency without detachment from the limited purpose district. This type of SOI is generally adopted when (a) the limited service provider is providing adequate, cost effective, and efficient services, (b) the multiservice agency is the most logical provider of the other services, (c) there is no feasible or logical SOI alternative, and (d) inclusion of the territory is in the best interests of local government organization and structure in the area.

In determining the SOI, LAFCO requires the following determinations pursuant to Section 13.11 of the Alameda LAFCO Specific Proposal Policy Manual (LAFCO, 2019):

- The service capacity, levels, and types of services currently provided by the agency and the areas where these services are provided, topographic factors, financial capabilities, costs of service, and social and economic interdependencies.
- Existing and planned land uses and land use policies, including consistency with county and city general plans, regional and State plans, and special district master service plans.
- Projected growth in the affected area and potential effects on agricultural and open space lands.
- A description of the services that will be provided to any areas, which may be added to the SOI, and the timing and method for funding expansion of facilities or services.
- An analysis of the effects a proposed SOI may have on other agencies and their service capabilities, including improved or diminished service levels, potential duplication of services, and underutilization of public infrastructure due to ineffective planning.
- The opportunity for infill development of incorporated vacant lands located adjacent to or within already developed areas rather than SOI expansions.
- The potential for political and functional consolidations or other reorganizations when boundaries divide communities.
- The location or use of sewerage facilities (either developed or planned), police and fire protection service, waste disposal, provision of water transmission mains, water supply (either planned or developed), parks and recreation services, compatible street circulation, economic and social relationships, geographic or natural topographic features, such as rivers, ridge lines, and ravines, and manmade barriers, such as freeways, major streets, and railroads.

The CKH Act stipulates several procedural requirements for updating SOIs. It requires that special districts file written statements on the class of services provided and that LAFCO clearly establish the location, nature, and extent of services provided by special districts.

LAFCO must notify affected agencies 21 days before holding the public hearing to consider the SOI and may not update the SOI until after that hearing (LAFCO, 2019). The LAFCO Executive Officer must issue a report including recommendations on the SOI amendments and updates under consideration at least five days before the public hearing.

1.5 - Municipal Service Review Process

The MSR process is a comprehensive assessment of the ability of existing government agencies to effectively and efficiently provide services to residents and users. The form and content of the MSR are governed by requirements of the CKH Act and the LAFCO MSR Guidelines.

The CKH Act requires all LAFCOs, including Alameda LAFCO, to prepare an MSR for each of its incorporated cities and special districts (CALAFCO, 2019). The fundamental role of LAFCO is to implement the CKH Act by providing for the logical, efficient, and most appropriate formation of local municipalities, service areas, and special districts. These MSRs must be completed prior to, or in conjunction with, the update of an SOI or before LAFCO initiates any reorganization of district boundaries.

Often, more than one agency is evaluated in an MSR. The MSR can be structured by type of agency (i.e., all the fire districts or all the community service districts), or it can be structured by service type (i.e., all agencies providing water service). This MSR will evaluate the agencies that provide water, wastewater, flood control, and/or storm drainage services in Alameda County. This will include 14 cities and 10 special districts. This review is intended to provide Alameda LAFCO with all necessary and relevant information related to the operations and management of the service districts and municipalities within Alameda County. This report will be used as a tool for agencies to make better service-related decisions.

SECTION 2 - AGENCY OVERVIEW

2.1 - Service Providers

Within Alameda County, many local agencies and special districts provide water, wastewater, flood control, and/or storm drainage services to their respective residents. These services are collectively referred to in this MSR as utility services. Some agencies and districts provide multiple communities with utility services. Agencies can be grouped into three types:

Limited purpose special districts: These agencies provide one or more of the utility services discussed in the MSR but do not provide any other public services. There are many types of special districts that California State law authorizes to be formed to provide specific limited public services. For this MSR, there are two flood control districts, one water district, three sanitary districts, one community services district, and one municipal utility district.

Multipurpose agencies: These agencies provide utility services as well as other public services, such as police protection, fire protection, or solid waste collection. The agencies' utility services reviewed in this MSR include 14 cities and two County Service Areas.

Other agencies: These agencies provide utility services in Alameda County but are not subject to Alameda LAFCO's jurisdiction. They include multicounty public agencies, State and federal agencies, and private service providers.

Table 2-1 identifies the eight limited purpose agencies reviewed in this MSR and, in general, the type of utility services that they provide. Each are independent special districts with their own elected boards. The specific type of services will be more fully described in Sections 4 through 7. Figure 2-1 maps the location of the limited purpose agencies. Dublin San Ramon Services District and East Bay Municipal Utility District both have territory in both Alameda and Contra Costa Counties. Alameda County has been determined to be the principal county for preparation of MSRs such as this MSR.

Table 2-2 identifies the 16 multipurpose agencies and the utility services they provide. The specific type of services will be more fully described in Sections 4 through 7. In addition to these utility services, the cities all provide a full range of municipal services. Castlewood CSA also provides street maintenance services. Five Canyons CSA also provides graffiti removal and street, landscape, open space, and retaining wall maintenance. The County Service Areas are dependent special districts governed by the Alameda County Board of Supervisors and managed by the Alameda County Public Works Agency. Figure 2-2 maps the location of the multipurpose agencies.

**Table 2-1
Limited Purpose Special Districts**

Limited Purpose Agencies	Water	Wastewater Collection	Wastewater Treatment	Flood Control	Storm Drainage
Alameda County Flood Control and Water Conservation District				●	
Alameda County Water District	●				
Castro Valley Sanitary District		●			
Dublin San Ramon Services District	●	●	●		
East Bay Municipal Utility District	●		●		
Oro Loma Sanitary District		●	●		
Union Sanitary District		●	●		
Zone 7 Water Agency	●			●	

**Table 2-2
Multipurpose Cities and Special Districts**

Multipurpose Cities and Special Districts	Water	Wastewater Collection	Wastewater Treatment	Flood Control	Storm Drainage
Castlewood CSA	●	●			
City of Alameda		●		●	●
City of Albany		●		●	●
City of Berkeley		●		●	●
City of Dublin				Zone 7	●
City of Emeryville		●			●
City of Fremont				ACFWCD	●
City of Hayward	●	●	●	ACFWCD	●
City of Livermore	●	●	●	Zone 7	●
City of Newark				ACFWCD	●
City of Oakland		●		ACFWCD	●
City of Piedmont		●		●	●
City of Pleasanton	●	●		Zone 7	●
City of San Leandro		●	●	ACFWCD	●
City of Union City				ACFWCD	●
Five Canyons CSA					●

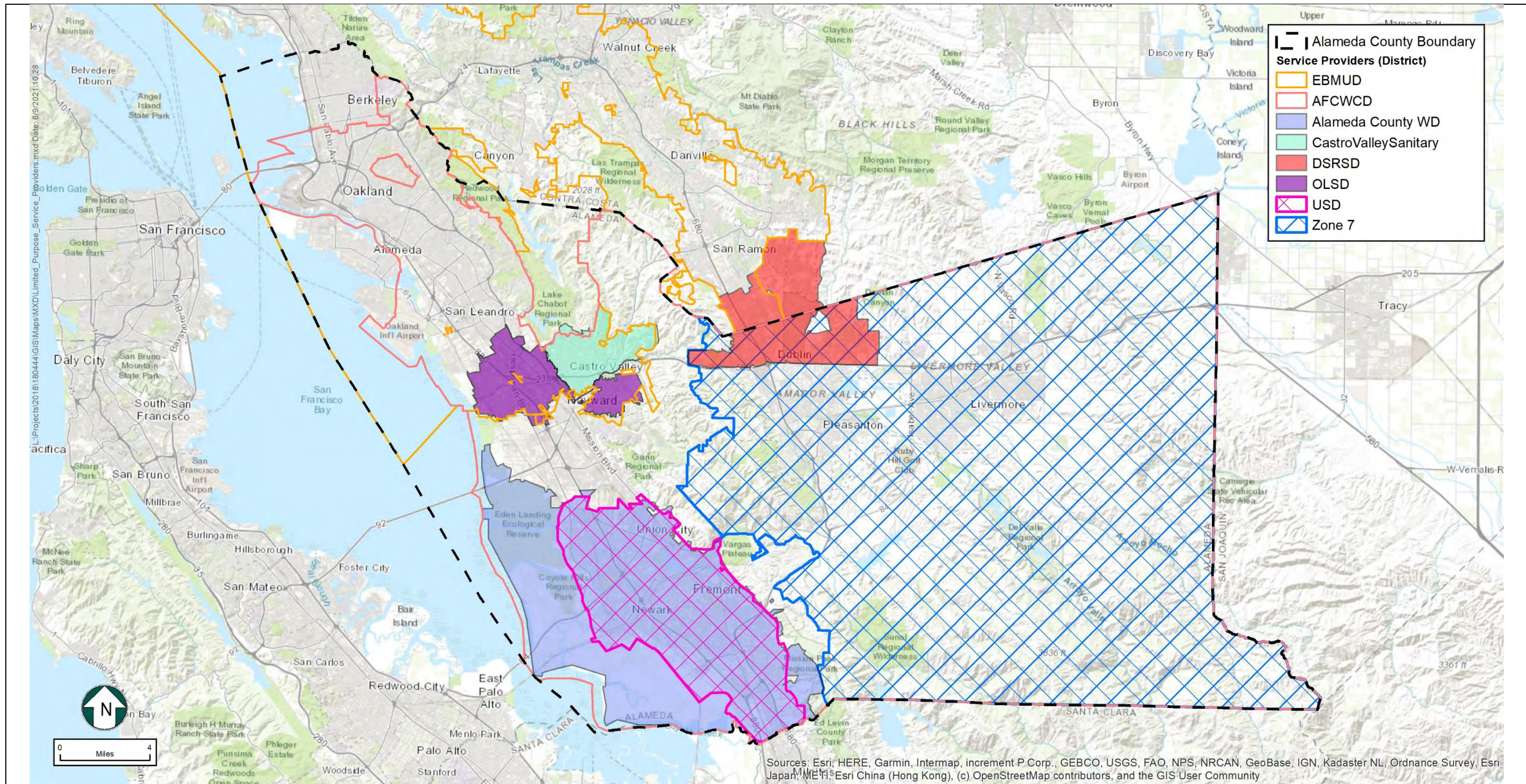


Figure 2-1
Map of Limited Purpose Agencies



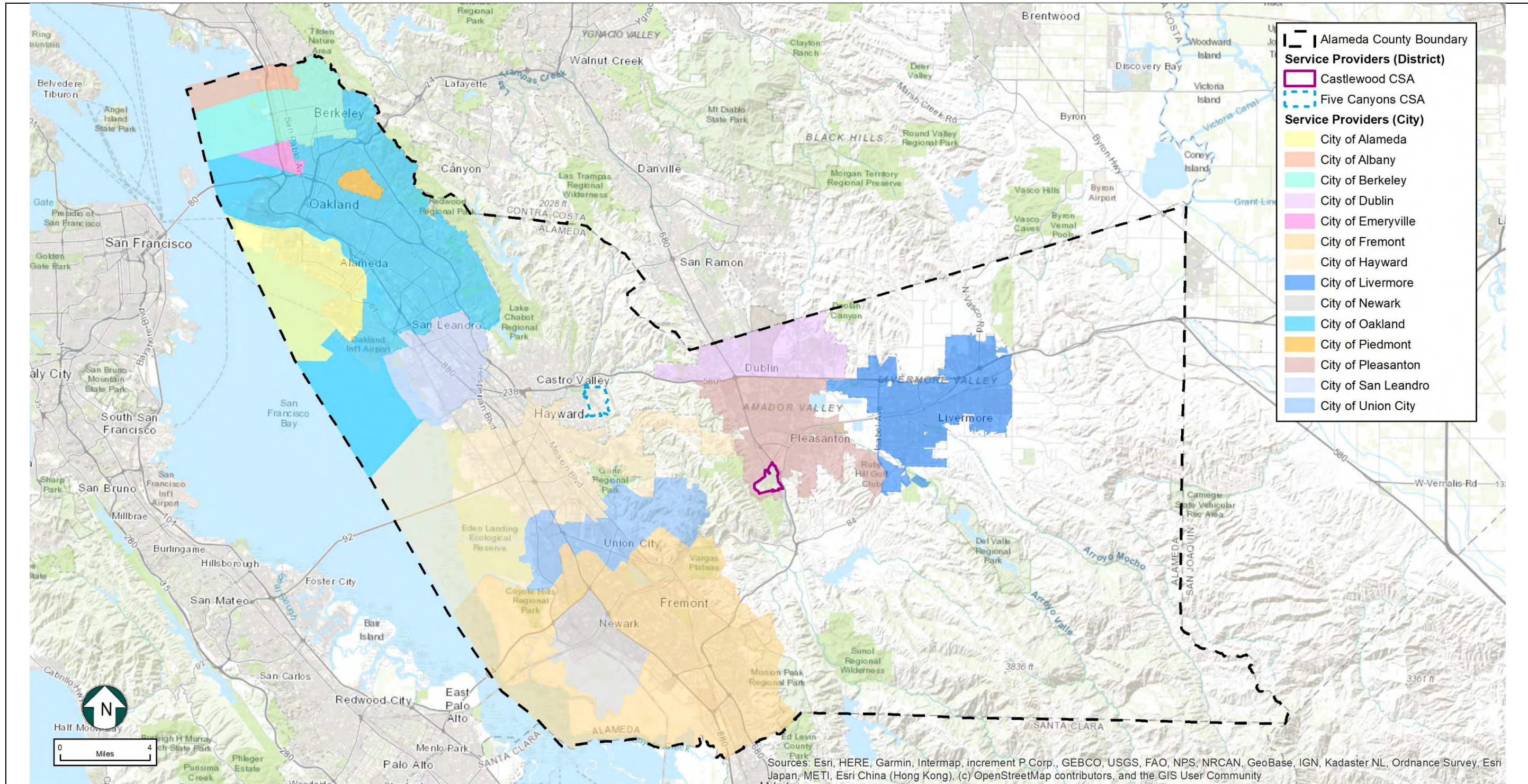


Figure 2-2
Map of Multipurpose Agencies



The report includes reference to other utility providers not under the jurisdiction of Alameda LAFCO. Table 2-3 identifies agencies not under Alameda LAFCO’s purview that are providing utility services.

**Table 2-3
Other Agencies Providing Utility Services**

Other Agencies	Water	Wastewater Treatment	Wastewater Disposal	Flood Control	Storm Drainage
California Water Service Company	●				
County of Alameda					●
DSRSD-EBMUD Recycled Water Authority	●				
East Bay Dischargers Authority		●	●		
Livermore-Amador Valley Water Management Agency			●		
San Francisco Public Utilities Commission ¹	●				
State Water Project	●				

Table 2-4 describes which agency is providing service to a specific geographic area of the County. Each of the incorporated areas are listed, along with the County’s five unincorporated census designated places, and the two communities that have County Services Areas.

2.2 - Growth and Population Projections

This section reviews the residential and daytime population as well as projected residential and economic growth. Using the Association of Bay Area Governments’ (ABAG) 2018 projections, this section discusses projected growth from 2015 to 2040 (Governments, 2019). Population increases and job growth rates were projected prior to the pandemic. It is still unclear how the post-pandemic recovery will affect changes in these projections.

2.2.1 - RESIDENTIAL POPULATION

According to ABAG projections, the population in Alameda County is expected to increase 22 percent in the next 20 years. By 2040, ABAG projects the population for the entire County to increase by approximately 381,000 residents. Projected numbers will increase from approximately 1.7 million in 2020 to approximately 1.9 million in 2030, to approximately 2.1 million in 2040. The greatest total population increase is projected for the cities of Oakland and Fremont, while the greatest percentage increase is projected in the cities of Emeryville and Dublin. See Table 2-5 for population growth rates for cities and districts with available data over the next 20 years.

¹ SFPUC also provides wastewater and storm drainage services, but not in Alameda County.

Table 2-4
Service Providers by Geographic Location

Geographic Location	Water Production & Treatment					Water Distribution		Wastewater			Flood Control	Maintenance	Stormwater Permitting/ Inspections	Preventing
	Importing	Extraction/ Wells	Groundwater Mgmt.	Treatment	Recycled Water	Potable	Recycled	Collection	Treatment	Disposal				
Cities														
Alameda	EBMUD			EBMUD		EBMUD		City	EBMUD	EBMUD	City	City	City	City
Albany	EBMUD			EBMUD		EBMUD		City	EBMUD	EBMUD	City	City	City	Private ²
Berkeley	EBMUD			EBMUD		EBMUD		City	EBMUD	EBMUD	City	City	City	City
Dublin	DSRSD				DERWA	DSRSD	DERWA	DSRSD	DSRSD	LAVWMA and EBDA	Zone 7	City and Private	City	Private ²
Emeryville	EBMUD			EBMUD		EBMUD		City	EBMUD	EBMUD	ACFWCD	City	Ac Environmental Health (inspection)	Private ²
Fremont	ACWD	ACWD	ACWD	ACWD		ACWD ³		USD	USD	EBDA	ACFWCD	City	Union Sanitary District (inspection)	City
Hayward	SFPUC			SFPUC		City ⁴		City	City ⁵	EBDA	ACFWCD	City	City	City
Livermore		Zone 7	Zone 7	Zone 7	City	City and Cal Water	City	City	City	LAVWMA and EBDA	Zone 7	City	City	City
Newark	ACWD	ACWD	ACWD	ACWD		ACWD		USD	USD	EBDA	ACFWCD	City	City	City
Oakland	EBMUD			EBMUD		EBMUD		City	EBMUD	EBMUD	ACFWCD	City	City	City
Piedmont	EBMUD			EBMUD		EBMUD		City	EBMUD	EBMUD	City	City	City	City
Pleasanton	City				DERWA	City	DERWA	City	DSRSD ⁶	LAVWMA and EBDA	Zone 7	City	City	City
San Leandro	EBMUD			EBMUD		EBMUD		City	City ⁵	EBDA	ACFWCD	City	City	City
Union City	ACWD	ACWD	ACWD			ACWD		USD	USD	EBDA	ACFWCD	City	City	City
Unincorporated Census Designated Places														
Ashland	EBMUD			EBMUD		EBMUD		OLSD	OLSD	EBDA	ACFWCD	County	County	County
Castro Valley	EBMUD			EBMUD		EBMUD		CVSD and OLSD	CVSD and OLSD ⁷	OLSD and EBDA	ACFWCD	County	County	County
Cherryland	EBMUD			EBMUD		EBMUD		OLSD	OLSD	EBDA	ACFWCD	County	County	County
Fairview	EBMUD			EBMUD		EBMUD		OLSD	OLSD	EBDA	ACFWCD	County	County	County
San Lorenzo	EBMUD			EBMUD		EBMUD		OLSD	OLSD	EBDA	ACFWCD	County	County	County
Sunol	SFPUC			SFPUC		SFPUC					Zone 7	County	County	County
Unincorporated Communities with CSAs														
Castlewood	SFPUC			SFPUC		Castlewood CSA		Castlewood CSA and Pleasanton ⁸	DSRSD	LAVWMA and EBDA	Zone 7	County	County	County
Five Canyons	EBMUD			EBMUD		EBMUD		OLSD	OLSD		ACFWCD	County	County	County

² In Albany, Dublin, and Emeryville, street sweeping is privately operated under City contract.

³ California Water Service Company (Cal Water) provides water to a very small portion of Fremont.

⁴ East Bay Municipal Utility District (EBMUD) provides water service to a small portion of Hayward.

⁵ Oro Loma Sanitary District (OLSD) provides wastewater collection and treatment to a portion of San Leandro and a small portion of Hayward

⁶ The City of Livermore provides wastewater treatment to a small portion of Pleasanton.

⁷ Castro Valley Sanitary District (CVSD) owns 25% of the Oro Loma Sanitary District/Castro Valley Sanitary District Water Pollution Control Plant, which is operated by OLSD.

⁸ Wastewater from Castlewood County Service Area's collection system utilizes City of Pleasanton's collection system to reach the treatment plant operated by Dublin San Ramon Service District.

**Table 2-5
Population Projections⁹**

Agency	2020	2030	2040	Increase 2020-2040	Percentage Increase 2020-2040
Alameda	87,460	90,560	92,465	5,005	6%
Albany	19,285	19,925	20,425	1,140	6%
Berkeley	127,520	135,680	140,935	13,415	11%
Dublin	51,070	71,870	83,595	32,525	64%
Emeryville	12,260	16,050	34,130	21,870	178%
Fremont	231,970	239,610	275,440	43,470	19%
Hayward	154,280	160,295	178,270	23,990	16%
Livermore	84,935	99,115	113,730	28,795	34%
Newark	44,905	45,990	47,720	2,815	6%
Oakland	480,270	554,325	650,625	170,355	35%
Piedmont	10,765	11,040	11,170	405	4%
Pleasanton	75,030	78,370	87,875	12,845	17%
San Leandro	98,635	103,910	107,520	8,885	9%
Union City	76,215	78,100	79,845	3,630	5%
UNINCORPORATED AREA ONLY	156,865	163,800	168,620	11,755	7%
ALL ALAMEDA COUNTY	1,711,460	1,868,635	2,092,370	380,910	22%
Alameda County Water District	353,300	382,500	415,600	62,300	18%
Castro Valley Sanitary District	66,086	69,012	71,037	4,951	7%
Dublin San Ramon Services District ¹⁰	126,100	150,240	171,740	45,370	36%
East Bay Municipal Utility District ¹¹	1,405,000	1,542,000	1,704,000	299,000	21%
Oro Loma Sanitary District	134,100	146,420	163,948	29,848	22%
Union Sanitary District	353,090	363,700	403,005	49,915	14%
Alameda County Flood Control and Water Conservation District	1,463,875	1,560,563	1,666,871	202,996	14%
Five Canyons CSA	3,710	3,985	4,259	549	15%
Castlewood CSA	621	671	724	103	17%
Zone 7 Water Agency	265,000	265,794	297,497	32,497	12%

⁹ City population projections are from ABAG's Projections 2040 (2018) and are not reflective of actual 2020 Census population. For special districts, specific projections are not available. Future population projected using the respective local or regional jurisdiction estimated growth rate.

¹⁰ Population projections are for Alameda County portion of a multicounty agency.

¹¹ Projections from 2020 UWMP.

2.2.2 - ABAG PROJECTIONS COUNTYWIDE

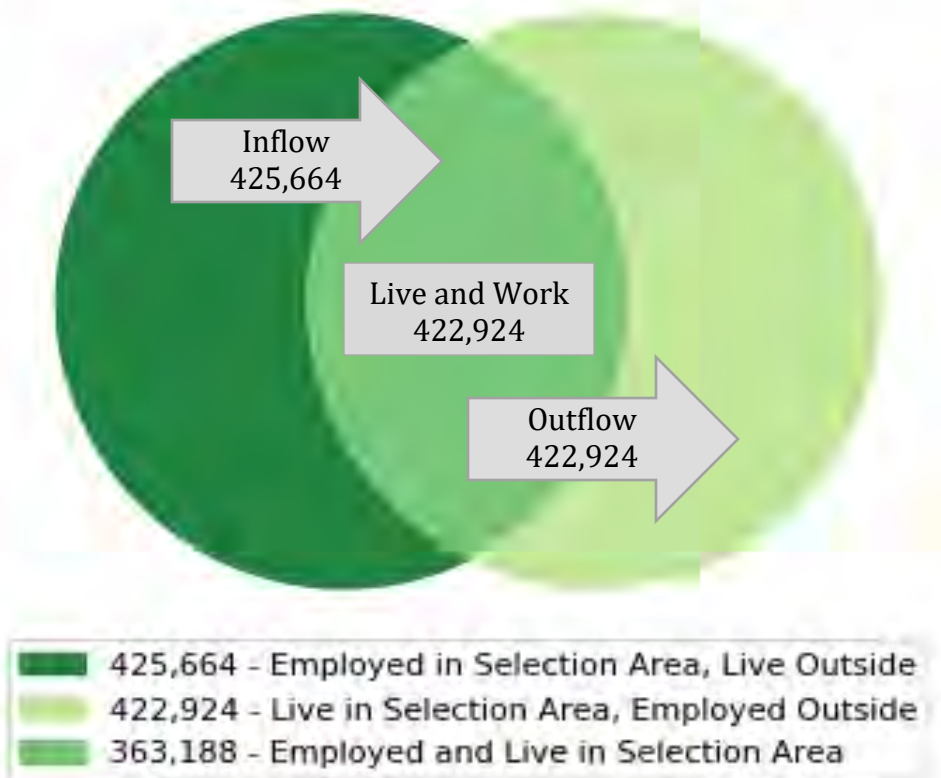
The Plan Bay Area 2040 projections from the Association of Bay Area Governments collects data and presents projected growth of the San Francisco Bay Area, its nine counties, 101 cities, and smaller geographic areas. It is a limited and focused update of the first Plan Bay Area, adopted by ABAG and the Metropolitan Transportation Commission (MTC) in 2013. The revised data in the Plan 2040 projections differ in level and distribution of growth from projections in 2013, reflecting changing expectations for growth in the region.

2.3 - Daytime Population

This section reviews the daytime population throughout Alameda County. Chart 2-1 illustrates the inflow and outflow of jobs. Figure 2-3 illustrates the location of jobs in Alameda County. According to data from the United States Census, the population of residents living outside Alameda County is greater than the number of residents living within Alameda County and working outside the County or residents living and working within the County (Census, 2019). By 2040 the number of jobs is projected to increase by 952,940.

According to the Census Bureau, Center for Economic Studies (CES), the daytime population expands by approximately 2,740 people countywide, bringing the total daytime population of Alameda County to approximately 1,670,000 as of 2017. The daytime population of each city varies based on the number of jobs and residents. Because the number of employees entering and leaving the County is similar, the daytime population for the County only increases by approximately 0.2 percent, but in some cities, daytime population change is rather significant. For example, Emeryville's population increases 144 percent in the daytime.

Chart 2-1
Alameda County Inflow/Outflow Job Counts
Inflow/Outflow Job Counts in 2017



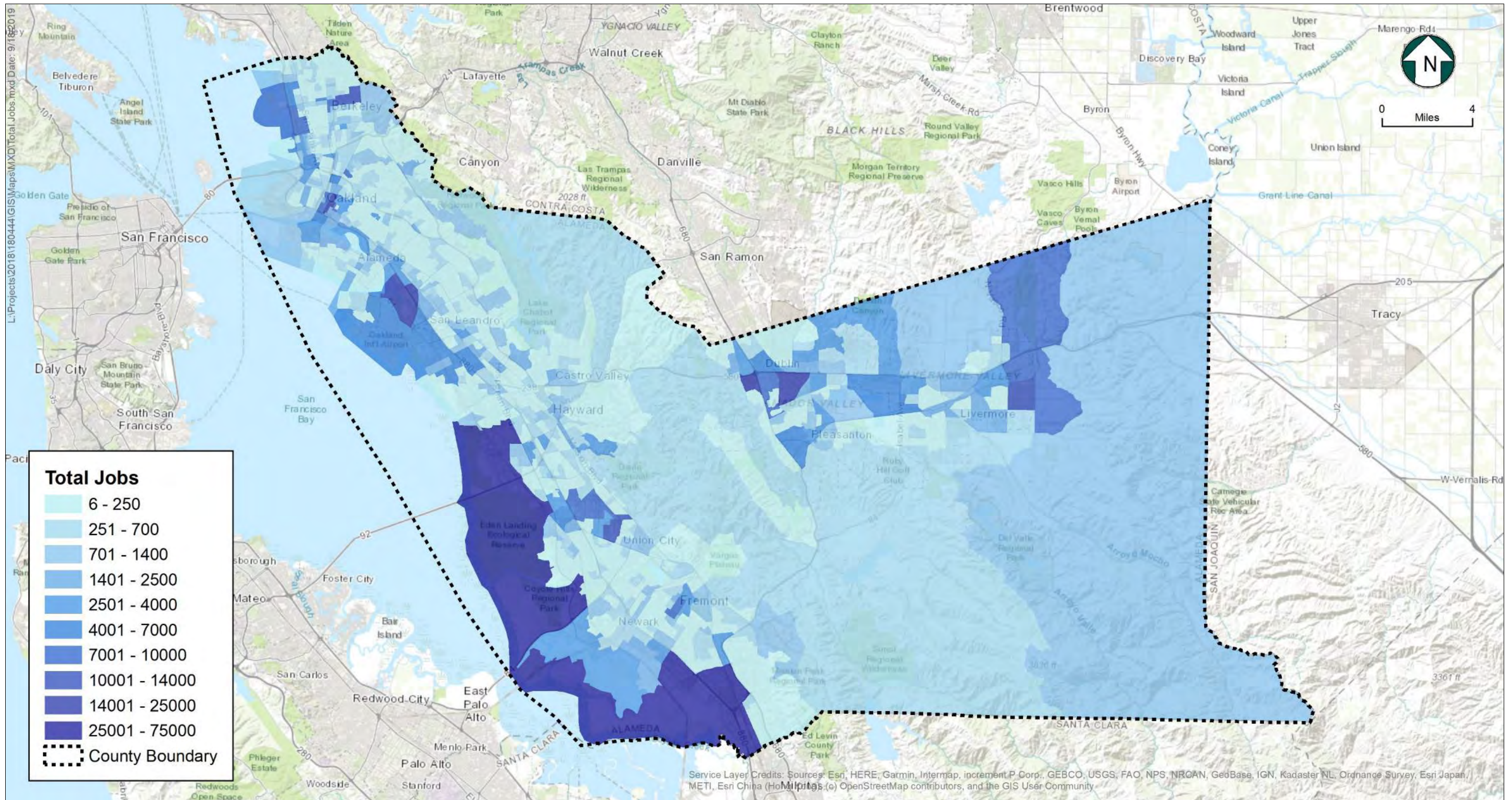


Figure 2-3
Total Jobs



Table 2-6 lists the inflow and outflow of the daytime population by city with net and percentage change.

**Table 2-6
Daytime Population (2017)**

	Inflow	Live and Work within County	Outflow	Net Change	Daytime Population	Percent Change
Alameda	22,914	5,296	34,624	-11,710	75,015	-14%
Albany	3,842	452	7,536	-3,694	15,416	-19%
Berkeley	54,878	10,893	35,811	19,067	138,592	16%
Dublin	17,968	1,651	24,664	-6,696	43,284	-13%
Emeryville	22,888	547	5,988	16,900	28,680	144%
Fremont	97,799	21,595	91,564	6,235	228,390	3%
Hayward	60,520	10,965	65,456	-4,936	146,024	-3%
Livermore	40,763	10,650	35,303	5,460	88,805	7%
Newark	17,188	1,827	22,117	-4,929	39,536	-11%
Oakland	155,424	52,498	144,249	11,175	453,900	3%
Piedmont	1,717	173	6,003	-4,286	6,364	-40%
Pleasanton	61,852	6,442	30,822	31,030	101,590	44%
San Leandro	45,089	5,220	41,941	3,148	89,368	4%
Union City	29,579	3,453	33,897	-4,318	71,357	-6%
ALL ALAMEDA COUNTY	425,664	363,188	422,924	2,740	1,628,520	<1%

Source: Census Bureau, Center for Economic Studies

2.4 - Projected Job Growth

ABAG projects that the number of jobs within Alameda County will increase from approximately 859,000 in 2020 to 901,000 in 2030 and to 953,000 in 2040. Service sector jobs are projected to increase slightly more rapidly than others.

ABAG projects that Oakland, Fremont, Pleasanton, and Dublin will see the largest increase in jobs by 2040. This will result in an expanded daytime population as more people are likely to commute to these cities if jobs are created at a rate higher than the rate of new housing. Projected annual job growth by city is shown in Table 2-7.

Generally, projected job growth rates exceed projected residential growth rates. ABAG is projecting the number of jobs in Alameda County will grow more rapidly than the residential population. It can be assumed that these jobs will be filled by residents of the County and the remainder by commuters from other counties. Because projected growth in the ratio of jobs per resident in Alameda County is higher than in the Bay Area as a whole and higher than in neighboring Contra Costa and Santa Clara counties, it can be assumed that a large portion of jobs will be filled by residents of other counties. In other words, the projections are consistent with an increase in commuting.

**Table 2-7
Projected Jobs**

	2020	2030	2040	Increase 2020- 2040	Percentage Increase 2020-2040
Alameda	38,905	41,730	42,420	3,515	9%
Albany	4,925	5,080	5,190	265	5%
Berkeley	116,435	118,885	121,670	5,235	4%
Dublin	21,330	24,205	31,115	9,785	46%
Emeryville	19,765	19,920	20,010	245	1%
Fremont	103,130	110,300	118,460	15,330	15%
Hayward	69,910	74,555	77,805	7,895	11%
Livermore	43,025	43,950	45,870	2,845	7%
Newark	19,055	21,130	22,875	3,820	20%
Oakland	247,310	259,175	272,760	25,450	10%
Piedmont	1,945	1,950	1,930	-15	-1%
Pleasanton	65,185	66,940	75,440	10,255	16%
San Leandro	54,695	57,830	59,610	4,915	9%
Union City	24,065	26,120	28,105	4,040	17%
UNINCORPORATED AREA	29,010	29,315	29,680	670	2%
ALL ALAMEDA COUNTY	858,685	901,080	952,940	94,255	11%

Source: Association of Bay Area Governments, and United States Census

Various characteristics play a part in determining the increase or decrease of jobs per resident, such as job type, availability of jobs, housing cost, and availability of affordable housing. The County of Alameda currently has more residents living within its county limits and working outside of its jurisdiction. This resembles the characteristics of bedroom communities. For example, Union City is setting strategic policies to produce more jobs per resident in order to evolve into a more balanced community. Similarly, Alameda and Fremont are projected to produce significantly more jobs, evolving into more heavy commercial areas.

2.5 - Growth Strategies and Areas

This section reviews growth strategies, constraints, and areas in subregions of Alameda County.

2.5.1 - ALAMEDA COUNTY: (CASTRO VALLEY AND EDEN AREA PLAN) UNINCORPORATED

In November 2000, the Alameda County electorate approved the Save Agriculture and Open Space Lands Initiative (Measure D) that revised the Urban Growth Boundary in the East County to reserve less land for urban growth and more land for agriculture and open space, applying similar policies to rural Castro Valley and Palomares Canyonlands. A countywide vote is required to change Measure D policies.

Measure D amended the Alameda County General Plan to establish the Urban Growth Boundary (UGB), increase minimum parcel sizes, and restrict development envelopes, floor area ratios, and maximum floor areas outside the UGB. Measure D restricted the nature and extent of land uses outside the UGB to agriculture, resource management, watershed management, and low-density rural residential uses. It also prohibits providing or authorizing expansion of public facilities or other infrastructure that would create more capacity than needed to meet the development allowed. Public facilities or other infrastructure will not be prohibited if they do not have an excessive growth-inducing effect. Furthermore, new landfill capacity is limited to a maximum of 15 years' worth of volume. Once capacity drops to this level, estimated to occur in 40 years' time, new incremental capacity may need annual approval. In addition, Measure D requires that all the unincorporated County's Regional Housing Needs Allocation has to be accommodated within the voter-approved UGB.

Land use in Castro Valley is primarily residential. Commercial uses are concentrated along Castro Valley Boulevard, Redwood Road, Grove Way, and in several neighborhood shopping centers. Public and quasi-public uses, such as schools, libraries, and churches, are spread throughout the area, adjacent to both commercial and residential uses. In contrast to Castro Valley's past growth, new housing units will be added through infill development, primarily from the redevelopment of under-built sites, additional units on lots that are already developed, and some development on vacant lots. This growth strategy will add approximately 2,394 households and increase the total number of households in Castro Valley to 25,620 by 2025.

The Eden area consists of unincorporated land in western Alameda County between the cities of San Leandro and Hayward and west of the County's Castro Valley area. The Eden area will provide renewed residential areas, affordable neighborhoods with housing choices that fit the needs of all residents, and investments in the economic development of the community to revitalize selected underutilized transportation corridors and create new districts of concentrated economic activity.

2.5.2 - TRI-VALLEY: DUBLIN, LIVERMORE, PLEASANTON

The Tri-Valley subregion continues to experience the most rapid growth in the County, and in this area, Dublin is the most rapidly growing city. Alameda County's Urban Growth Boundary (Measure D) is coterminous with the Urban Growth Boundary of Pleasanton, Livermore, and Dublin.

Dublin encourages mixed-use and higher-density development adjacent to current and planned transit stations. The City's plans include comprehensive infrastructure planning for all Sphere of Influence areas, allowing for mixed uses of land with flexible development standards and promoting affordable housing. Growth outside the western boundary is constrained by Urban Growth Boundary policies. The City of Dublin has four Planning Areas: Primary, Dublin Crossing, Eastern Extended, and Western Extended. For all Planning Areas, Dublin's 2017 General Plan anticipates a total buildout population maximum of 82,788 residents and a maximum of 123,703 jobs.

Livermore's UGB was completed in two phases, northern and southern UGBs. While both UGBs share goals of preserving agriculture and open space and preventing urbanization, the policies regarding development beyond each UGB and changes to each UGB are different. Livermore has implemented infill policies. The City's UGB promotes infill and preservation of open space. The UGB limits growth, and any modification must be approved by the electorate. In the event of UGB expansion or annexation, the City prohibits development on slopes of 25 percent or more and prohibits grading on slopes of between 10 and 25 percent. Although various land uses are permitted in the southern growth area, the area is primarily designated for low-density residential use. Though limited by the City's Urban Growth Boundary (UGB), there remains residential development potential north of North Livermore Park and south of Raymond Road.

Through its growth management program, Pleasanton establishes an annual limit for new residential units, requires the apportionment of yearly total new residential units to categories of projects, and defines a process for obtaining an allocation under the program. The City's UGB limits growth to the existing urbanized area. The City's UGB distinguishes areas generally suitable for urban development, where urban public facilities and services are provided from those areas not suitable for development. Areas outside of the UGB are generally suitable for long-term protection of natural resources, agriculture, grazing, parks and recreation, public health and safety, subregionally significant wildlands, community buffers, and scenic ridgeline views.

County policy promotes urban land use, preserves open space and agricultural lands, and limits available unincorporated land. The Measure D UGB restricts new development to a territory near or within existing urban areas. There are development opportunities inside the UGB north of Dublin. Around Livermore, there are areas to the west and on the north side south of Raymond Road.

2.5.3 - SOUTHERN: FREMONT, NEWARK, UNION CITY

Union City policy encourages high-density and mixed-use development. Lands are redeveloped to more intensive uses, transitioning from low-density to high-density mixed-use. A city hillside plan limits development in the eastern hillsides. Union City is concentrating its redevelopment efforts in the vicinity of its BART station, where its recent General Plan envisions constructing a transit village with multifamily residential, offices, and further development at an industrial park. In addition, the General Plan envisions industrial development in the northwest portion of Union City. The Union Landing development is expected to continue to attract retail and office investment until it is fully built out around the year 2020.

Fremont's growth strategies include promoting affordable housing by providing a density maximum of 25 percent and growth model analysis in conjunction with strategic plan preparation every five years. Fremont's growth is expected to occur primarily through infill development, redevelopment and conversion, and intensification opportunities throughout the community. The City also retains a large supply of industrially designated land, primarily located westerly of I-880 but also between I-880 and I-680 south of Auto Mall Parkway.

Newark promotes infill development primarily in commercial areas. According to the Newark General Plan, 1,800 acres of Newark's total area was in residential use. About 375 acres were in commercial use, and 930 acres were in industrial or office-flex use. Another 270 acres was in public or institutional use, and 1,130 acres consisted of roads and other rights of way. The sum of these areas is roughly 4,500 acres or 50 percent of the land area of the City of Newark. The remaining 50 percent of Newark's land consists of undeveloped or non-urbanized land. Of this total, approximately 960 acres are vacant and designated for development. The remaining 3,535 acres include "conservation" open space (280 acres), agriculture (70 acres), public parkland and other "improved" open space (160 acres), and approximately 3,025 acres of land use for salt harvesting, refining, and production. Salt harvesting, refining, and production represent approximately one-third of Newark's land area. Newark's General Plan identifies commercial infill development throughout underutilized commercial areas.

2.5.4 - CENTRAL: ALAMEDA, HAYWARD, SAN LEANDRO

The City of Alameda's growth policy is mainly focused on promoting affordable housing and commercial redevelopment. Since most of the City area is an island, new development only exists as infill and redevelopment projects, such as at Alameda Point. Future growth is expected to be most significantly affected by the redevelopment of Alameda Point, formerly Naval Air Station Alameda, where as many as 15,000 residents will be added during the next 20 years as well as clean light-industrial and office uses, resort and conference facilities, ecotourism, and historical attractions such as the Hornet, and new small and youth-operated businesses.

Hayward promotes sustainable development projects designed and operated to minimize resource consumption, reduce dependency on the automobile, preserve sensitive environmental resources, reduce maintenance and utility expenses, and improve social health and interaction. Hayward's policies support growth patterns that protect the open space and natural resources by maintaining established urban limit lines and directing housing and employment growth toward infill sites and underutilized properties. Land use policies align with the Bay Area's Regional Transportation Plan and Sustainable Communities Strategy by directing growth by integrating housing with regional transit, employment services, and amenities. Hayward promotes infill and redevelopment concentrated in areas served by transit or close to major employment centers.

San Leandro studies and implements zoning amendments along thoroughfares to promote infill. The City also promotes infill through various economic assistance programs and means of alternative transportation modes. There are scattered and relatively small potential residential growth areas in San Leandro. Formerly industrial sites are available for mixed-use development. The San Leandro General Plan envisions approximately 80 percent of the new housing to be built in three "transit-oriented development" areas.

In the unincorporated areas of San Lorenzo, Ashland, and Cherryland, County policy promotes infill and redevelopment of underutilized or undeveloped areas and new development near existing BART stations. In the Castro Valley and Fairview areas, County

policy promotes infill development, redevelopment of commercial areas, and redevelopment of large residential lots to meet housing demands. The Measure D UGB restricts new development to a territory near or within existing urban areas.

2.5.5 - NORTHERN: ALBANY, BERKELEY, EMERYVILLE, OAKLAND, AND PIEDMONT

Albany growth strategies include upgrading commercial development, promoting a mix of commercial development, protecting residential neighborhoods from adverse impacts of adjacent commercial use, and increasing the economic vitality of industrial areas. There is little vacant developable land within the City. Albany anticipates residential growth as a result of new, planned UC Berkeley housing facilities. The University Village, located at Buchanan and San Pablo Avenues, is a 26-acre redevelopment project including retail, commercial, campus housing, a community center, an infant-toddler daycare facility, administrative offices, recreational facilities, and open space. The residential uses are subject to a maximum density of 34 units per net acre.

Berkeley provides a building height bonus of one additional level for affordable housing or cultural use projects. Other practices include transportation demand strategies, such as subsidized bus passes to reduce downtown congestion and demand for parking. Berkeley growth areas identified by the City's General Plan include the downtown area as well as the southside redevelopment area located along the west side of the UC Berkeley campus. In the southside area, growth is projected to include increased housing opportunities for students.

Emeryville zoning ordinances and programs encourage infill as well as the conversion of industrial use to denser commercial and residential uses. Growth areas in the City of Emeryville include redevelopment housing projects on 36th and San Pablo Avenue and mixed-use redevelopment on the site of the former King Midas Card Club.

Oakland encourages infill development to preserve open space and is implementing a plan to attract development to the downtown area. Redevelopment policy encourages growth in older, blighted neighborhoods, particularly in four redevelopment areas. Oakland is also developing transit villages at BART station locations. Oakland growth areas include Chinatown, the airport area, West Oakland, and the hill areas. The Chinatown area is growing due to mixed-use housing development and various neighborhood improvements. In the airport vicinity, East Oakland is projected to experience high job growth from airport-related jobs. West Oakland is another commercial development growth area. The main residential growth areas are in the North and South Hills areas. Oakland has a plan to attract 10,000 residents to the downtown area, is building a transit village at the Fruitvale BART station, and is exploring the idea of transit villages at other BART stations.

Piedmont is largely built out but has been allocated close to 600 new housing units in the latest Regional Housing Needs Assessment. If constructed, the population would grow faster than ABAG's projected growth rate.

2.6 - Determinations

- The residential population of Alameda County is projected to grow 22 percent between 2020 and 2040 to a population of about 2.1 million.
- About 45 percent of the new residential growth is projected to occur in the City of Oakland. Fremont, Dublin, Emeryville, and Hayward are also projected to increase more than other cities or the unincorporated area.
- The daytime population of Alameda County does not change significantly. Pleasanton, Berkeley, and Emeryville see the greatest increase between residential and daytime populations. Emeryville has the greatest percentage increase in population during the day.
- The number of jobs in Alameda County is projected to increase from approximately 859,000 in 2020 to 953,000 in 2040.
- Job growth is projected to be highest in Oakland, Fremont, Pleasanton, and Dublin.
- Land decisions are under the jurisdiction of Alameda County in the unincorporated areas and the 14 cities within their respective city limits. Most jurisdictions have urban growth boundaries that direct growth to already urbanized areas and promote infill development, higher densities, and better access to public transit. Such policies help reduce the need to expand utility service lines into new areas and instead make full use of existing infrastructure.

SECTION 3 - DISADVANTAGED UNINCORPORATED COMMUNITIES

3.1 - Identification of DUCs

Disadvantaged unincorporated communities (DUCs) are defined as inhabited territory (12 or more registered voters) that constitutes all or a portion of a community with an annual median household income of \$53,735, which is less than 80 percent of the statewide annual median household income of \$67,169 in 2017 (US Census Bureau, 2017). These communities were identified as an area of concern by Senate Bill 244 that was adopted into State law in 2011. DUCs may lack essential municipal services, such as water or sewer service, as they may have been developed prior to infrastructure being installed in proximity to them. Pursuant to State law, LAFCO is required to identify any adjacent DUCs during an SOI review and determine if they should be included within any SOI amendment of a city or special district or potentially included during the consideration of any special district formation in the future.

Alameda LAFCO has adopted a policy (Policy 14.6) (LAFCO, 2019) rather than accepting the criteria adopted with SB 244. Therefore, DUCs will be identified by using only census designated places (CDPs) as outlined by the local rules and procedures.

According to Figure 3-1, there is one CDP that is below the threshold established for median household income. The CDP of Ashland has a median household income of \$50,966 (US Census Bureau, 2017). However, Ashland is currently within the boundaries of districts that provide water and wastewater services, EBMUD (water) and OLSD (wastewater). Furthermore, Ashland is also within the boundaries of AFCWCD, which provides flood control services to the community as well. As a result, there is no need to adjust spheres of influence for any agencies in an effort to provide water or wastewater services to CDPs below the median household income threshold as they are already receiving the aforementioned services.

Structural fire protection services are the other identified criteria required to be reviewed and analyzed for DUCs. However, this MSR is not reviewing structural fire protection service agencies or their corresponding spheres of influence. Such analysis should be conducted during the review of fire protection districts and city SOIs as it relates to such services.

3.2 - Determinations

- Alameda LAFCO has adopted a policy that states that disadvantaged unincorporated communities should be identified only by using census designated places (CDPs).
- The community of Ashland is the only CDP with a median income that would qualify it to be considered a disadvantaged unincorporated community. However, the community is already being provided with water, sewer, and flood control services by EBMUD, OLSD, and AFCWCD, respectively, so no changes to spheres of influence are recommended based on its potential DUC status.

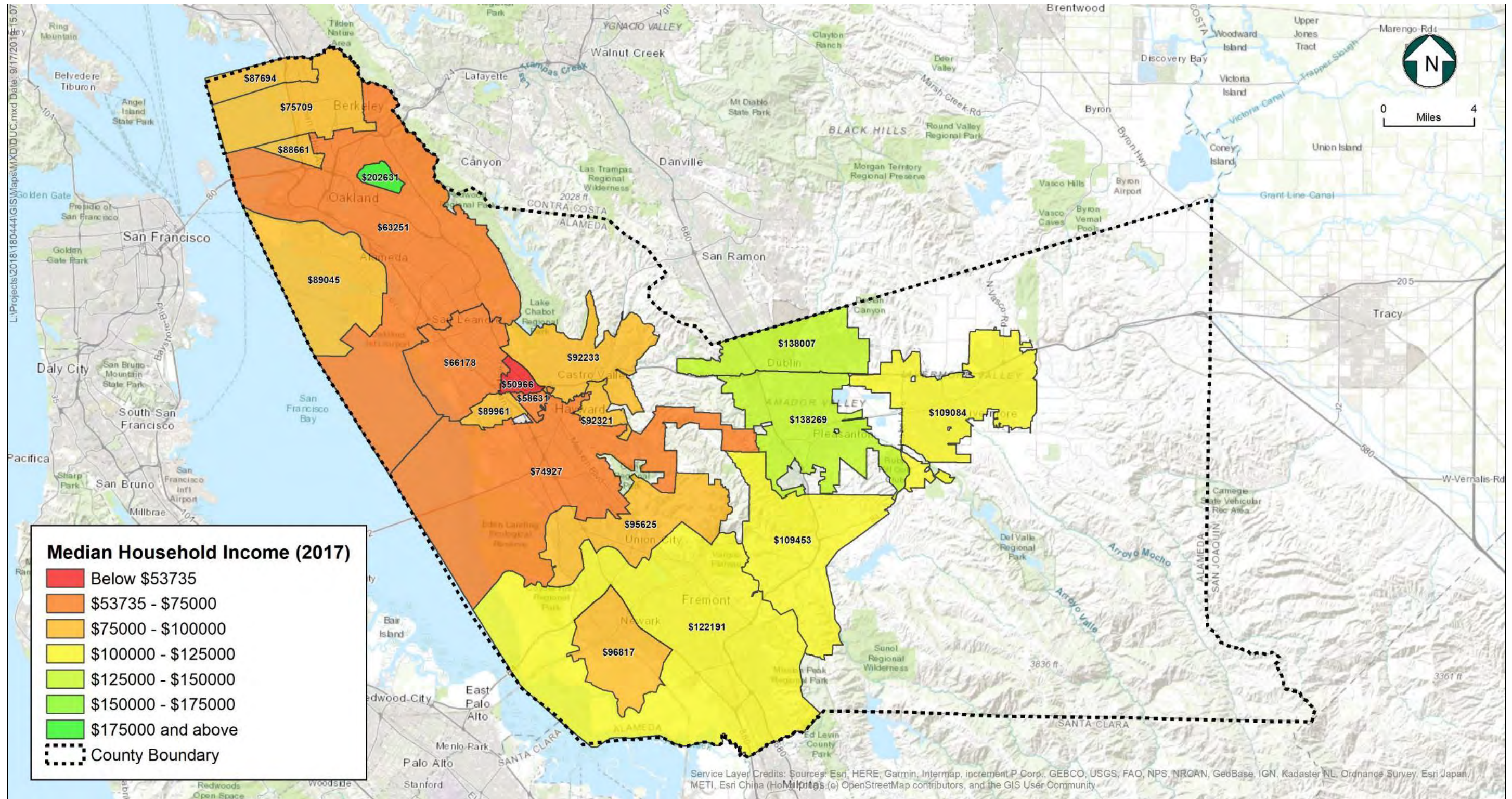


Figure 3-1
Median Household Income (2017)



SECTION 4 - WATER SERVICES

4.1 - Provider Overview

This section provides an overview of the water service providers, supply chains, and water service areas in Alameda County. This section provides a brief profile of each water service provider. Table 4-1 lists each of the water service providers, along with the type of water services provided in Alameda County. The table is meant to be a summary, and a more detailed description is provided below. The MSR focuses on significant water utility services provided by agencies in the County subject to LAFCO review but does include basic information on other agencies and minor systems serving communities or transients. Table 4-2 lists the water service providers by geographic location. Figure 4-1 shows the boundaries of the water providers in the County. If districts are providing service outside the boundaries or outside of Alameda County, it is not reflected in this map.

**Table 4-1
Water Service Providers**

Agency	Wholesale: Production & Treatment					Retail Distribution		
	Surface Water	Extraction/ Wells	Ground- water Mgmt.	Treatment	Recycled Water	Potable	Raw	Recycled
Limited Purpose Agencies								
Alameda County Water District (ACWD)	●	●	●	●		●		
Dublin San Ramon Services District					See DERWA	●		See DERWA
East Bay Municipal Utility District	●			●	● See DERWA	●		See DERWA
Zone 7 Water Agency	●	●	●	●		●	●	
Multipurpose Agencies								
Castlewood CSA						●		
City of Hayward					●	●		
City of Livermore					●	●		●
City of Pleasanton						●		See DERWA
Other Providers								
California Water Service Co. (Cal Water)						●		
DSRSD-EBMUD Recycled Water Authority (DERWA) ¹²					●			●
San Francisco Public Utility Commission (SFPUC)	●	●		●			●	
State Water Project	●							

Source: Association of Bay Area Governments, Forecasts & Projections

¹² DERWA is a joint powers authority formed by DSRSD and EBMUD to provide recycled water. The City of Pleasanton also participates in the service.

**Table 4-2
Water Service Providers by Geographic Location**

Geographic Location	Wholesale: Production & Treatment					Retail Distribution		
	Importing	Extraction/ Wells	Ground- water Mgmt.	Treatment	Recycled Water	Potable	Raw	Recycled
Cities								
Alameda	EBMUD			EBMUD		EBMUD		
Albany	EBMUD			EBMUD		EBMUD		EBMUD
Berkeley	EBMUD			EBMUD		EBMUD		
Dublin	DSRSD	Zone 7	Zone 7	Zone 7	DERWA	DSRSD		DERWA
Emeryville	EBMUD			EBMUD		EBMUD		EBMUD
Fremont	ACWD	ACWD	ACWD	ACWD		ACWD ¹³		
Hayward	SFPUC			SFPUC		City ¹⁴		City ¹⁵
Livermore		Zone 7	Zone 7	Zone 7	City	City and Cal Water		City
Newark	ACWD	ACWD	ACWD	ACWD		ACWD		
Oakland	EBMUD			EBMUD		EBMUD		EBMUD
Piedmont	EBMUD			EBMUD		EBMUD		
Pleasanton	City	Zone 7	Zone 7	Zone 7	DERWA	City		DERWA
San Leandro	EBMUD			EBMUD		EBMUD		
Union City	ACWD	ACWD	ACWD			ACWD		
Unincorporated Census Designated Places								
Ashland	EBMUD			EBMUD		EBMUD		
Castro Valley	EBMUD			EBMUD		EBMUD		
Cherryland	EBMUD			EBMUD		EBMUD		
Fairview	EBMUD			EBMUD		EBMUD		
San Lorenzo	EBMUD			EBMUD		EBMUD		
Sunol	SFPUC			SFPUC		SFPUC		
Other Unincorporated Communities with CSAs								
Castlewood	SFPUC			SFPUC		Castlewood CSA		
Five Canyons	EBMUD			EBMUD		EBMUD		

¹³ California Water Service Company (Cal Water) provides water to a very small portion of Fremont.

¹⁴ ACWD provides water service to a small number of properties in Hayward.

¹⁵ Recycled water deliveries planned to begin in 2021.

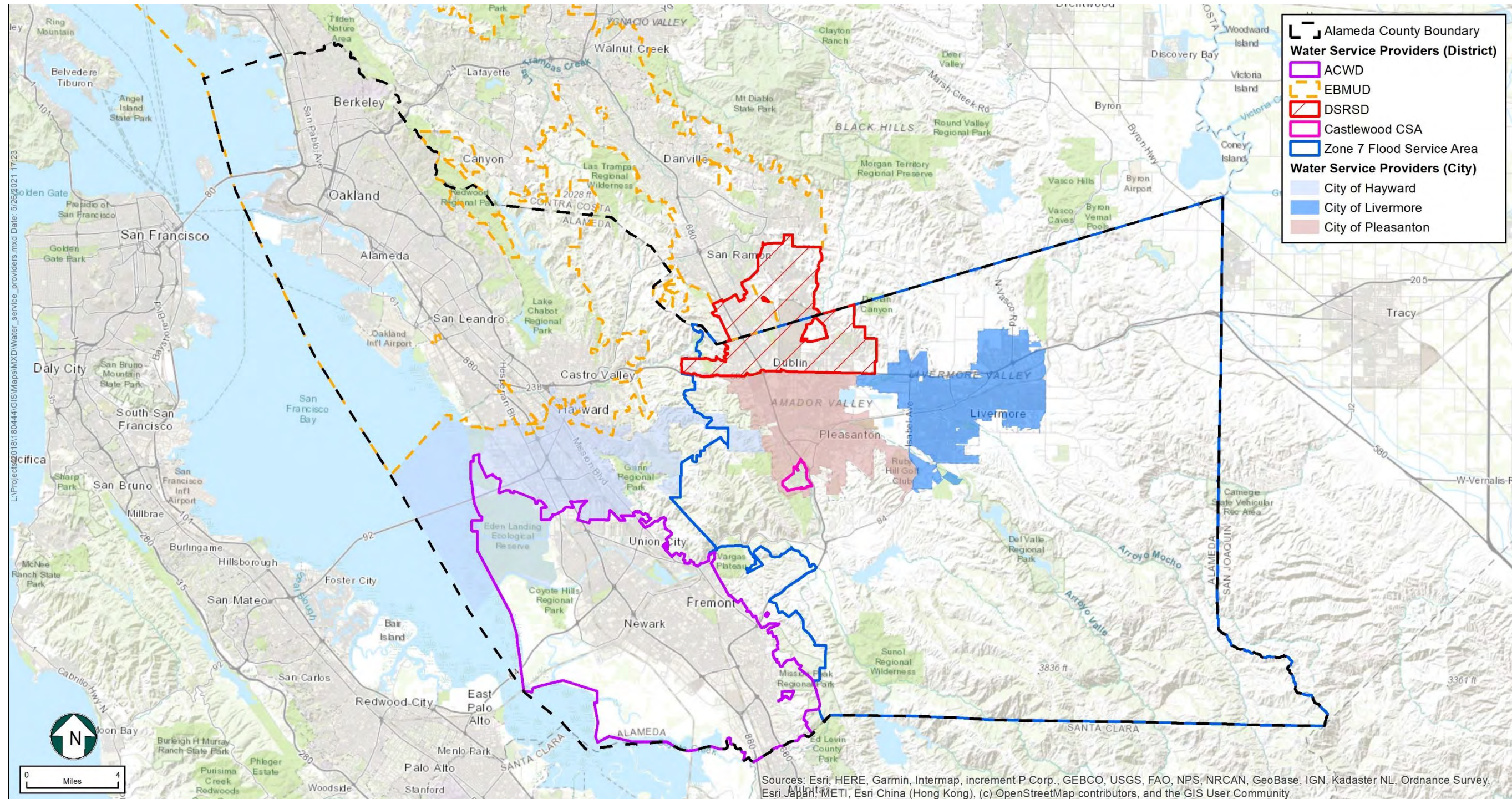


Figure 4-1
Water Service Providers



4.1.1 - LIMITED PURPOSE SERVICE AGENCIES

There are four special districts engaged in water services in Alameda County. They are the Alameda County Water District, Dublin San Ramon Services District, East Bay Municipal Utility District, and the Zone 7 Water Agency.

The Alameda County Water District (ACWD) provides retail water service, water treatment and groundwater management, extraction, and recharge services. Its retail service area includes the cities of Fremont, Union, and Newark, and its groundwater management service area also includes the southern portions of the City of Hayward. In 1914, the independent special district was formed under the County Water District Act of 1913. The purpose of this act was to protect the Niles Cone Groundwater Basin, conserve the Alameda Creek watershed, and develop supplemental water supplies, primarily for agricultural use. The District became a water distributor in 1930 and has since become an urban service provider. The system has four sources of water: The State Water Project's (SWP) Bay-Delta, the San Francisco Public Utility Commission (SFPUC) Hetch Hetchy system, local groundwater, and local runoff from Lake Del Valle.

The Dublin San Ramon Services District (DSRSD) provides retail water service and recycled water in collaboration with East Bay Municipal Utility District (EBMUD). DSRSD's wastewater services are discussed in Section 5. Its water retail service area includes the City of Dublin, a small unincorporated area northeast of Dublin, and the Dougherty Valley in Contra Costa County. Although the DSRSD boundary area includes the southern portion of the City of San Ramon, EBMUD is the water provider in that area. The Zone 7 Water Agency provides treated water and regulates groundwater extraction activities. DSRSD is also a part of the DSRSD-EBMUD Recycled Water Authority (DERWA), which provides recycled water to the agencies for service to each of the agencies' customers.

East Bay Municipal Utility District (EBMUD) provides comprehensive water services, including production, conveyance, treatment services, retail services, and water recycling. The District's wastewater services are discussed in Section 5. The District's water service area in Alameda County includes the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, San Leandro, portions of Hayward, and the unincorporated areas of Ashland, Cherryland, Castro Valley, Fairview, and San Leandro. EBMUD services the Contra Costa County cities of Richmond, El Cerrito, Pinole, Hercules, Orinda, Lafayette, Moraga, Walnut Creek, Danville, and San Ramon, along with other unincorporated areas. EBMUD is also the SGMA Groundwater Sustainability Agency (GSA) for the portion of the East Bay Plain Subbasin that underlies its services area. The independent special district was formed in 1923 under the Municipal Utility District Act to provide water services. Approximately 90 percent of EBMUD's water originates in the Mokelumne River watershed, and 10 percent originates as runoff from watershed lands in the East Bay Area. In dry years, EBMUD may also rely on additional sources including, but not limited to, water available under its Central Valley project contract or water purchased from willing buyers through water transfers. EBMUD is also part of both the Bayside Project, which in the future could be used to extract groundwater and the DERWA for recycled water.

The Zone 7 Water Agency provides wholesale water, water treatment, groundwater management, extraction and recharge, and retails raw (untreated) water to agricultural accounts. The Zone's flood control services are discussed in Section 6. The Zone's water service area includes the cities of Pleasanton, Dublin, and Livermore, as well as unincorporated areas covering the eastern portion of the County. As a wholesale water supplier to DSRSD, the Zone indirectly serves the Dougherty Valley in Contra Costa County. Zone 7 was formed in 1957 under the Alameda County Flood Control and Water Conservation District Act in order to achieve two goals: procure a reliable drinking water supply and provide storm drainage and flood control services. Since then, the agency has added an additional goal of groundwater management throughout eastern Alameda County per the 2016 Sustainable Groundwater Management Act. Additionally, Zone 7 provides water to Cal Water. Zone 7 has features of both a dependent and independent district.¹⁶ Its sources of water supply are the State Water Project's (SWP) Bay-Delta, local groundwater from the Livermore-Amador Main Basin, Lake Del Valle in the Livermore area, and the Kern County Groundwater Banks.

The Washington Township Health Care District (WTHCD) received potable water service from ACWD and relies on a private well for landscape irrigation. The WTHCD is not considered a water utility service provider.

4.1.2 - MULTIPURPOSE AGENCIES

There are four multipurpose agencies that provide water services in Alameda County: Castlewood County Service Area and the cities of Hayward, Pleasanton, and Livermore.

The Castlewood County Service Area (Castlewood CSA) consists of 587 acres in the unincorporated area of Alameda County located southwesterly of the City of Pleasanton along the Arroyo de la Laguna. The CSA encompasses 190 single-family residences and the Castlewood Country Club buildings and facilities. The Castlewood CSA had a service contract with the City of Pleasanton to operate and maintain their sewer and water systems. The CSA's sole source of water is from the Pleasanton well fields owned and operated by the San Francisco Public Utilities Commission (SFPUC).

The City of Hayward provides retail services for potable water. The City's potable water service area includes most of the territory within the city limits along with small areas located in the northern part of the City, which is part of unincorporated Alameda County but is served by the City's water system. Small areas within the City are served by EBMUD and an area to the east where the city limits extend into the East Bay foothills. The City relies on the San Francisco Public Utility Commission (SFPUC) Hetch Hetchy system for treated water. In an emergency, the City may extract water from groundwater wells. The SFPUC and EBMUD, along with Hayward, also developed Skywest Booster Pump Station (BPS), which is

¹⁶ Zone 7 is a zone of the Alameda County Flood Control and Water Conservation District (ACFWCD). Therefore, it is part of a dependent special district with certain governing decisions overseen by the County Board of Supervisors. Zone 7 differs from all the other ACFWCD zones, as it was created under special legislation and has an independently elected board with sole authority over all matters that relate solely to Zone 7.

located in Hayward and relies on the City's existing facilities to transfer water between SFPUC and EBMUD under emergency conditions. The southern portion of the City lies within the Niles Cone Groundwater Basin managed by ACWD. The East Bay Dischargers Authority (EBDA) distributes recycled water to the Skywest Golf Course in Hayward.

The City of Livermore provides retail service for potable water and also produces recycled water. The City provides water service directly to about 23 square miles of the City, including just over 10,000 service connections. The rest of the City of Livermore is provided water service by the California Water Service Company. The recycled water service area is limited to one zone (Zone 1) of its potable service area. The City relies on Zone 7 for potable water. In an emergency, the City may extract groundwater from wells subject to Zone 7 oversight.

The City of Pleasanton's water service area includes much of the area within the city limits, as well as unincorporated areas along Kilkare Road north of Sunol and a few parcels in the unincorporated Castlewood area. Zone 7 is the wholesale water and water treatment provider and is also responsible for groundwater management and recharge. Zone 7 extracts groundwater from wells and provides treated surface water to the City, accounting for approximately 75 percent of demand. The remaining 25 percent is provided via wells operated by the City. Additionally, the City of Pleasanton now provides recycled water provided by the DSRSD-EBMUD joint powers authority on a wholesale/contract basis (DERWA).

4.1.3 - OTHER PROVIDERS

There are three major water providers not under the jurisdiction of Alameda LAFCO: State Water Project, San Francisco Public Utility Commission, and the California Water Service Company. In addition, the DSRSD-EBMUD Recycled Water Authority (DERWA) is a joint powers authority that provides recycled water.

The State Water Project (SWP) is the primary source of water for Zone 7 and is a significant source for ACWD. SWP activities in Alameda County include operation of the South Bay Aqueduct and several reservoirs, as well as a segment of the California Aqueduct. SWP is owned by the State of California and operated by the State Department of Water Resources (DWR). State agencies are not under LAFCO jurisdiction.

San Francisco Public Utility Commission (SFPUC) activities in Alameda County include conveyance of Hetch Hetchy water, water treatment, and capture of local runoff. Within Alameda County, SFPUC provides wholesale water to ACWD and Hayward. It provides retail water service to the unincorporated Sunol and Castlewood communities as well as to the Lawrence Livermore National Laboratory. As a component of the City and County of San Francisco, SFPUC is under the jurisdiction of the San Francisco LAFCO.

The California Water Service Company (Cal Water) is an investor-owned (i.e., privately-owned) water utility providing service to approximately three-quarters of Livermore residents (Livermore District) and to numerous other communities throughout California. Zone 7 is the wholesale water and water treatment provider and is also responsible for

groundwater management and recharge. Zone 7 extracts groundwater from wells and provides all treatment services to Cal Water (although Cal Water also pumps its own groundwater. As an investor-owned water utility, the Cal Water service area and activities are under the jurisdiction of the California Public Utilities Commission.

DSRSD and EBMUD are a part of the DSRSD-EBMUD Recycled Water Authority (DERWA), which provides recycled water to the agencies for service to each of the agencies' customers. It is a joint powers authority formed in 1995 to encourage recycled water development in the San Ramon Valley. DERWA is directed by four board members, two from DSRSD and two from EBMUD. DERWA runs the San Ramon Valley Recycled Water Program (SRVRWP), which consists of the treatment, storage, and use of treated recycled water for landscape irrigation without parts of Blackhawk, Danville, Dublin, and San Ramon. Future phases of the program will extend recycled water into other parts of the San Ramon Valley.

4.2 - Service Demand

4.2.1 - WATER AVAILABILITY (SUPPLY)

Potable Water

Potable water is water that is safe to drink or to use for food preparation. Potable water service is available in most of the developed areas of the County. This is mostly supplied by the municipal water systems of the providers. Areas without municipal water service include Hayward Marsh, hill areas in eastern Fremont and Union City, ridge areas between and within Pleasanton and Hayward, and sparsely developed areas in eastern Alameda County. In some cases, service providers have been known to supply water services outside of the service boundary. Agencies are required to seek commission approval before extending service outside their boundaries.

The City of Livermore serves adjacent unincorporated areas outside its boundaries, to the north. Pleasanton coordinates with SFPUC to supply water to the unincorporated Castlewood area within Pleasanton and Sunol adjacent to the City. SFPUC service areas in Alameda County are outside the agency's boundaries. ACWD serves three areas outside its boundary, including southern Hayward and property in Fremont.

For emergency sharing of potable water, several of the agencies have interties. Emergency water sharing is currently available between the following agency pairings:

- EBMUD and DSRSD
- EBMUD and Costa Contra Water District
- EBMUD and City of Hayward
- ACWD and City of Milpitas in Santa Clara County
- ACWD and City of Hayward
- DSRSD and City of Pleasanton
- DSRSD and City of Livermore
- City of Livermore and Cal Water

- SFPUC and Santa Clara Valley Water District

EBMUD and SFPUC have developed an emergency intertie in Hayward. In 2002, the SFPUC formed a partnership with EBMUD and the City of Hayward to construct Skywest Pump Station and 1.5 miles of pipeline to link their systems. These facilities are now completed and can convey up to 30 mgd among these three agencies to boost water supply reliability when needed. EBMUD and SFPUC own these facilities jointly, while the City of Hayward maintains and operates them in coordination with EBMUD and SFPUC.

Recycled Water

In California, as well as in many water-scarce areas, water reclamation, recycling, and reuse are integral components of water resource planning and management. Historically, the driving motivation for water recycling was to supplement scarce resources and to provide alternatives to effluent disposal into surface waters. With periods of severe drought and a growing population, recycled water is now considered an important water resource. Engaging in non-potable and potable water reuse can enable communities to maximize and extend the use of limited freshwater resources.

The advancement of wastewater treatment processes has allowed recycled water to be produced and can be safely used for irrigation, industrial applications, groundwater recharge, and some commercial activities. Throughout the County, there is limited recycled water. California allows for the distribution of wastewater effluent, treated at a tertiary level, on food crops, school yards, parks, playgrounds, and golf courses. Wastewater effluent, treated at secondary levels, may be used for irrigation of restricted-access golf courses, cemeteries, freeway landscaping, and nurseries with unrestricted, public access (State Water Resources Control Board, 2018).

The Western Recycled Water Coalition (WRWC), formerly the Bay Area Recycled Water Coalition (BARWC), is an independent group of cities and public agencies in the Western United States working together to advocate federal funding for water reuse projects. There are currently 19 member agencies in the WRWC, which include five agencies that provide water within Alameda County: Cal Water, Hayward, Pleasanton, Dublin San Ramon Services District, and Zone 7 (Western Recycled Water Coalition, 2017). Current WRWC projects will provide 100,000 acre-feet per year of reliable, sustainable, drought-tolerant water supply. This volume of water is equivalent to meeting the household water needs for 875,000 people (Western Recycled Water Coalition, 2017).

California has one of the most developed regulatory environments for water reuse. In 2014, California adopted indirect potable reuse rules that provide detailed criteria for treatment processes, contaminants to test for, and how long treated water must remain underground. In 2018, the State finalized the Reservoir Augmentation statewide regulations that allow highly purified potable reuse water to be placed into drinking water reservoirs. The State does not currently have direct potable reuse regulations but is currently working on a DPR regulatory framework and research. AB 574 was signed into law in October 2017. The law sets a 2023 deadline for the development of Raw Water Augmentation regulations.

CITY OF HAYWARD

The City of Hayward is implementing Phase 1 of its Recycled Water Project to provide recycled water for irrigation of parks, schools, roadway medians, and landscaped areas around commercial and industrial buildings (City of Hayward, 2019). The Recycled Water Project consists of constructing a treatment facility, storage tank, and pump station at the Water Pollution Control Facility, as well as installing nine miles of distribution system pipelines and customer connections to deliver approximately 260,000 gallons per day of recycled water to Phase I customers. Construction of the distribution system pipelines, as well as the storage tank and pump station, was completed in spring 2020. In addition, retrofit of the 31 Phase I customer sites to connect them to the system will soon be completed, with deliveries anticipated to begin in 2021.

CITY OF LIVERMORE

The Livermore Water Reclamation Plant has been producing and distributing recycled water that meets Title 22 water requirements since 1966. The City's Water Reclamation Plant currently distributes an average of about two million gallons of recycled water per day, with a peak demand of almost 3.5 million gallons per day. The City has implemented a Recycled Water Master Plan. The plan identified a number of potential projects to extend recycled water infrastructure to large water users throughout the City for irrigation purposes (City of Livermore, 2016). Due to the high infrastructure cost associated with a dual distribution system, the City chose to continue to expand the use of recycled water in its recycled water use area. This includes selling a small amount of recycled water to the City of Pleasanton and retaining the rest of the existing recycled water production capacity for water supply uncertainty.

Livermore coordinates its water with other agencies. Wastewater transport out of the area is handled through the Livermore-Amador Valley Water Management Agency (LAVWMA), a joint powers authority composed of Dublin San Ramon Services District, City of Livermore, and City of Pleasanton. Since 1979, LAVWMA has owned the conveyance facilities that transport treated wastewater from the Livermore Water Reclamation Plant over the Dublin grade, and eventually to the East Bay Dischargers Authority, which dechlorinates the effluent and discharges it through a deep-water pipeline into the San Francisco Bay.

PLEASANTON

The Dublin San Ramon Services District is responsible for treating and discharging treated wastewater for Pleasanton. In 2014, the City of Pleasanton began using recycled water from the DSRSD-EBMUD Recycled Water Authority (DERWA) facilities and will be expanding use in the future. In 2014, the City began to receive recycled water supplies from the City of Livermore's Residential Recycled Water Program. Recycled water obtained from DERWA services Val Vista Park in the western portion of Pleasanton, and recycled water obtained from the City of Livermore services new development in the eastern portion of Pleasanton. The recycled water is used for irrigation.

In June of 2015, the State Water Resources Control Board approved financing through the Clean Water State Revolving Fund and Proposition 1 Program Grant to support the City's Recycled Water Project (City of Pleasanton, 2015). The goal of the project is to deliver recycled water supplies from DSRSD's Recycled Water Treatment Facility and the Livermore Water Reclamation Plant to irrigation customers along the recycled water distribution system, currently in the northern portions of the City. In August of 2016, the City began installation of the system. The project is projected to save approximately 450 million gallons of potable water.

DSRSD

DSRSD is part of the DSRSD-EBMUD Recycled Water Authority (DERWA), which provides recycled water to the agencies for service to each of the agencies' customers. It is a joint powers authority formed in 1995 to encourage recycled water development in the San Ramon Valley. DERWA is directed by four board members, two from DSRSD and two from EBMUD. DERWA runs the San Ramon Valley Recycled Water Program (SRVRWP), which consists of the treatment, storage, and use of treated recycled water for landscape irrigation without parts of Blackhawk, Danville, Dublin, and San Ramon. Future phases of the program will extend recycled water into other parts of the San Ramon Valley.

DSRSD, with the other Tri-Valley water retailers and Zone 7, completed a Tri-Valley Joint Potable Reuse Technical Feasibility Study in 2018, which demonstrated that potable reuse was a feasible water supply that could add seven percent to 15 percent to the Tri-Valley's potable water supply. Moreover, a 2015 community survey of the entire Tri-Valley commissioned by members of the Tri-Valley Water Liaison Committee determined that by 63 percent to 29 percent margin, the residents of Tri-Valley support the development of a potable reuse project.

EBMUD

EBMUD is one of a handful of large water utilities in California that provide both drinking water and wastewater services to a large urban area. This creates increased opportunities for integrating recycled water into its source water portfolio, including the future possibility of potable reuse. The District has been recycling water for irrigation and in-plant processes at its Main Wastewater Treatment Plant since 1971 and began its first golf course recycled water irrigation project in 1984. Today, the goal of the Recycled Water Program continues to be the planning, development, and implementation of recycled water projects throughout its service area to reduce the demand on EBMUD's drinking water supplies (East Bay Municipal Utility District, 2019).

EBMUD's Water Supply Management Program (WSMP) 2040 has a recycled water goal of 20 mgd by 2040 (East Bay Municipal Utility District, 2020). A "Recycled Water Master Plan" identified potential projects that could be implemented to meet the 20 mgd goal. That amount could save enough water to supply the indoor and outdoor water needs of more than 220,000 EBMUD residents per day by offsetting potable water demand.

Currently, there is approximately nine mgd of recycled water production capacity within EBMUD's water service area. The four recommended non-potable reuse projects in the updated Recycled Water Master Plan include continued expansion and implementation of the DERWA/San Ramon Valley Recycled Water Project (pending adequate supply), the East Bayshore Recycled Water Project, development of a new recycled water supply for the Phillips 66 refinery in Rodeo using effluent from the Pinole-Hercules and Rodeo Wastewater Treatment Plants, and expansion of the recycled water supply to the Chevron refinery in Richmond, potentially using the City of Richmond's Wastewater Treatment Plant. Most of the capital cost for construction for these projects is planned to occur after 2030.

ACWD

Currently, there are no uses of recycled water in the District service area, which offset demand for potable water, though the District's long-term supply strategy includes a potential recycled water project to provide upwards of 2,600 acre-feet (af)/year of non-potable supply. Union Sanitary District (USD) provides wastewater, collection, transport, treatment, and effluent disposal for the cities of Fremont, Newark, and Union City (encompassing the District service area). In 1993, the District coordinated with USD in the development of a Recycled Water Master Plan, which served as the basis for the District's recycled water use planning. While the source of recycled water will likely be from a joint project with USD, it could be sourced from another location, such as the South Bay Water Recycling Program. ACWD and USD have continuously reevaluated the feasibility of implementing a recycled water program with studies conducted in 1993, 2000, 2003, 2010, and 2015. These studies evaluated changed conditions affecting the feasibility of a non-potable recycled water project, including projected demand for recycled water and advances in treatment technology, and have come to document a continuous decline in the feasibility of a non-potable project.¹⁷ USD and ACWD are currently engaged in an update of the study scheduled for completion at the end of 2021.

Accordingly, the ACWD and USD Recycled Water Feasibility Study 2015/2016 was expanded to include an evaluation of indirect potable reuse (IPR). Advances in treatment technology and the successful, multi-decade operation of several IPR projects in California have led to new streamlined regulations allowing for the safe reuse of wastewater to supplement raw water supplies used to meet potable demands. An IPR project would use advanced treatment to purify wastewater to drinking water standards. However, as an added safety factor, this purified water would be used to help recharge the Niles Cone Groundwater Basin, where it would undergo additional natural filtering and dilution with other raw water sources before being produced as a potable supply at one of ACWD's groundwater production facilities. The 2015 study found that over 4,000 af of additional recharge supply could be provided by an IPR project and at a lower cost than a non-potable project. ACWD is presently conducting a next-level feasibility study of IPR potential with USD and SFPUC. The findings of this study,

¹⁷ Non-potable demand feasibility has reduced due to a reduction in water-intensive manufacturing, elimination of two previously planned future golf courses, and a suite of state-imposed regulations that in combination reduce the future demand for irrigation. (ACWD Water Supply Assessment for The Station East Project, June 2020)

as well as refinements to ACWD’s recycled water planning, will be included in the 2020–2025 UWMP, currently in preparation.

ZONE 7

Zone 7 does not currently handle wastewater or recycled water; however, the City of Livermore, Pleasanton, and the Dublin San Ramon Services District, all water supply retailers, are involved in wastewater and recycled water activities. Recycled water is currently only used for non-potable applications, primarily landscape irrigation. Zone 7 and the Tri-Valley water retailers completed a Tri-Valley Joint Potable Reuse Technical Feasibility Study in 2018, which demonstrated that potable reuse was a feasible water supply that could add seven percent to 15 percent to the Tri-Valley’s potable water supply.

4.2.2 - WATER DEMAND BY USE/CONSUMPTION

Water is needed for urban, agricultural, and environmental purposes. Agricultural and environmental water uses account for 40 percent and 50 percent of demand statewide, respectively, and urban uses account for 10 percent of demand (Public Policy Institute of California, 2020). California’s water system is energy intensive, accounting for nearly 10 percent of the State’s greenhouse gas (GHG) emissions (PPIC Water Policy Center, 2016). According to the Public Policy Institute of California’s 2016 publication titled “Energy and Water,” approximately 20 percent of statewide electricity use and 30 percent of business and home use of natural gas goes to pumping, treating, and heating water. State policies have begun to promote managing water and energy in tandem. Some State programs provide grants for water and energy efficiency programs, and the California Public Utilities Commission (CPUC) is working with utilities to quantify energy savings from water conservation. During the latest drought, the California Energy Commission (CEC) also launched an effort to reduce the energy sector’s vulnerability to water shortages.

Within Alameda County, water demand is predominantly urban. Irrigation accounts for only 11 percent of demand countywide, as seen in Table 4-3 below. Residential water use accounts for 63 percent of demand. Commercial and industrial use accounts for 15 percent. Public, institutional, and other uses constitute 11 percent of demand.

**Table 4-3
Average Daily Water Demand by Use**

Residential Indoor	Residential Outdoor	Commercial/Industrial	Irrigation/Landscape	Public/Other
10%	53%	15%	11%	11%

Domestic water is used for outdoor uses, toilet flushing, showering, cleaning, and kitchen uses. Outdoor uses, such as landscaping, swimming pools, and washing cars, are the most significant portion, consuming 53 percent of domestic water statewide. Water for toilet flushing has been the single highest residential indoor use (California Department of Water Resources, 2011), although progress has been made through the installation of low-flow and

no-flow toilets. Showering and bathing consume about 18 percent of domestic water. The remainder of California water consumption relates to cooking and other kitchen uses.

Demand Drivers

Urban water demand is primarily affected by population, economic growth, and water use efficiency. Population and economic growth lead to greater water use. As the number of residents and jobs grow, more showers are taken, toilets flushed, and dishes washed. Not only does demographic and economic growth affect water demand, so too does the efficiency of water use.

Some jurisdictions implemented tiered water rates as a technique to promote water conservation under the assumption that water use levels change in response to changes in water price. As a result of a 2015 court case, agencies can no longer use tiered rates simply as a water conservation incentive. However, some water agencies still permitted and used tiered water rates based on the cost of service. Other conservation measures include programs specifically designed to reduce customer demand and improve water fixture efficiency.

New State and federal requirements for the efficiency of plumbing fixtures have been implemented in the last few decades. Governor Jerry Brown signed an executive order in 2015 to improve the efficiency of water appliances in new and existing buildings throughout the State, including new standards that encompass toilets, urinals, kitchen and public lavatory faucets, and shower devices. The California Energy Commission has approved new standards for all kinds of water appliances, including showerheads and lavatory faucets (California Energy Commission, 2015).

Conservation programs help expedite consumers' rate of conversion of more efficient plumbing fixtures. All of the major water retailers offer consumer rebates for efficient clothes washers and toilets, lawn conversion, smart irrigation control, rain barrels, and other water-saving devices.

Agricultural water use is generally determined by the extent of irrigated acreage, the relative proportions of types of crops grown, climatic conditions, and irrigation efficiency.

4.2.3 - DROUGHT YEARS SUPPLY AND DEMAND

The following is an analysis of water supply and demand in a drought period lasting up to three years of the four major water providers over which LAFCO has jurisdiction. Tables 4-4 through 4-6 show the water supply/demand during a future drought of up to three years. The numbers are from each agency's Urban Water Management Plan. ACWD's UWMP provides an analysis of the current scenario. The other two agencies' UWMP provides an analysis of the current scenario as well as projected 2030 and 2040 scenarios.

Table 4-4
ACWD Drought Years Supply/Demand (Acre-feet)

Year	2016
1st Year Supply	55,300
1st Year Demand	53,300
1st Year Need for Water	0
2nd Year Supply	56,600
2nd Year Demand	55,000
2nd Year Need for Water	0
3rd Year Supply	62,200
3rd Year Demand	57,000
3rd Year Need for Water	0

Table 4-5
EBMUD Drought Years Supply/Demand (Acre-feet)

Year	2020	2030	2040
1st Year Supply	204,000	209,000	215,000
1st Year Demand	203,000	204,000	214,000
1st Year Need for Water	0	0	0
2nd Year Supply	174,000	178,000	184,000
2nd Year Demand	174,000	178,000	185,000
2nd Year Need for Water	0	0	1
3rd Year Supply	174,000	166,000	145,000
3rd Year Demand	174,000	178,000	184,000
3rd Year Need for Water	0	13,000	48,000

Table 4-6
Zone 7 Water Agency Drought Years Supply/Demand (Acre-feet)

Year	2018	2023	2028	2033
1st Year Supply	67,626	77,626	76,950	76,950
1st Year Demand	48,000	52,100	56,000	58,300
1st Year Need for Water	0	0	0	0
2nd Year Supply	61,396	71,396	70,720	70,720
2nd Year Demand	48,700	53,000	56,600	58,400
2nd Year Need for Water	0	0	0	0
3rd Year Supply	64,626	74,626	73,950	73,950
3rd Year Demand	49,900	53,800	57,000	58,600
3rd Year Need for Water	0	0	0	0

DSRSD has potable water storage to accommodate over twice the average day demand. DSRSD's potable water demand in 2020 was 9.2 million gallons per day, and DSRSD has 25 million gallons of potable water storage

EBMUD can meet customer demands out to 2040 during normal years and single dry years. According to the Water Master Plan, its strategy is to pursue a variety of supplemental supply projects simultaneously to minimize the risks associated with any one project. EBMUD is also looking for opportunities to partner with other agencies and water rights owners. The supplemental supply components that EBMUD may pursue in order to ensure delivery of emergency water supplies during dry years include, but are not limited to, purchasing water through transfers, exploring regional desalination projects, and groundwater banking/exchange efforts, and expanding surface water storage.

Per Zone 7's 2020 Urban Water Management Plan, it will need to develop supplemental supplies to meet the demand. Zone 7 is participating or studying several water supply options, including Water Transfers, Sites Reservoir, Delta Conveyance, Los Vaqueros Reservoir Expansion/Transfer Bethany Pipeline, and Desalination or Potable Reuse.

4.2.4 - WATER CONSERVATION MEASURES

The water providers promote water conservation using demand management strategies and supply-wide conservation approaches. The State of California has also mandated conservation efforts in recent years.

In 2016, Governor Brown issued Executive Order B-37-16, entitled "Making Water Conservation a California Way of Life." The order directed the State Water Resources Control Board (SWRCB) and the Department of Water Resources (DWR) to establish a long-term framework for water conservation and drought planning. This included strengthened standards for indoor residential per capita water use, outdoor irrigation, and new satellite imagery data. The requirements also include adequate actions to respond to droughts lasting at least five years as well as more frequent and severe periods of drought.

Senate Bill No. 606 & Assembly Bill No. 1668

Senate Bill No. 606 (SB 606) and Assembly Bill No. 1668 (AB 1668) were introduced as partner bills by Senator Hertzberg of Van Nuys and Assembly member Friedman of Glendale, each relying on the other to be passed. These bills build on the Brown administration's plan to modernize the State's management framework for drought resiliency by focusing on water use efficiency. Existing law already requires California to achieve a 20 percent reduction in urban water use by 2020, requires every urban retail water supplier to submit an Urban Water Management Plan to DWR, and authorizes the governing body of a public water supply distributor to declare a water shortage emergency whenever it finds that the ordinary demands of water cannot be satisfied without depleting the water supply. These two bills made additions to the water code.

Pursuant to the bills, the SWRCB and DWR must establish long-term urban water use efficiency standards by June 30, 2022. DWR must also conduct landscaping and climate studies by 2021. DWR will then provide this data to the SWRCB and local water suppliers for development or urban water use objectives.

Urban retail water suppliers must calculate an urban water use objective and actual water use by 2023 to be updated November 1 every year thereafter. The bills also set a standard limit of 55 gallons per person, per day, until January 1, 2025, for residential indoor water use. After that date, the amount will be incrementally reduced over time. On January 1, 2030, the limit will decrease to 50 gallons per capita per day.

Agricultural water suppliers are also required to adopt water management plans. The plan must be updated before April 1, 2021, and thereafter on or before April 1 in the years ending in “6” and “1.” The plan must be submitted to the DWR within 30 days after the option.

The bills impose civil liability for a retailer’s violation of a regulation up to \$1,000 per day that the violation occurs. If an urban water supplier does not prepare, adopt, and submit its urban water plan to DWR, the supplier is ineligible to receive any water grant or loan unless it complies with the requirements for adopting a plan.

Best Management Practices

Prior to 2018, the majority of the water providers in Alameda County pledged to develop and implement 14 conservation “best management practices” (BMPs) as signatories to the California Urban Water Conservation Council (CUWCC) agreement.

These efficiency standards have been replaced by State legislation. In May of 2018, Governor Brown signed two bills, SB 606 and AB 1668, with the goal to “make water conservation a California way of life.” The bills emphasize efficiency and stretching existing water supplies throughout California. Specifically, the bills call for the creation of new urban efficiency standards for indoor use, outdoor use, and water lost to leaks, as well as any appropriate variances for unique local conditions. The State Water Board will adopt these standards by regulation no later than June 30, 2022. Each urban retail water agency will annually, beginning November 2023, calculate its own objective based on the water need in its service area. Urban water agencies must meet their water use objective.

Sustainable Groundwater Management Act (SGMA)

In 2014, the State of California adopted legislation to help manage its groundwater with SGMA. According to SGMA, local Groundwater Sustainability Agencies (GSAs) must be formed for all high and medium priority basins in the State. These GSAs must develop and implement Groundwater Sustainability Plans (GSPs) for managing and using groundwater without causing undesirable results, such as significant groundwater-level declines, groundwater-storage reductions, seawater intrusion, water-quality degradation, land subsidence, and surface-water depletions; these are also referred to as sustainability indicators. The SWRCB and DWR are the two lead State agencies implementing SGMA. The

U.S. Geological Survey (USGS) and a number of other agencies and organizations conduct a broad range of technical activities to support the GSAs, DWR, and the SWRCB.

There are currently three developing GSAs in Alameda County: East Bay Municipal Utility District, City of Hayward, and Alameda County Water District. In July 2019, the Department of Water Resources approved two Alternatives to a Groundwater Sustainability Plan in Alameda County: one for the Niles Cone Groundwater Basin (Alameda County Water District) and the other for the Livermore-Amador Valley Groundwater Basin (Zone 7 Water Agency). Both Alameda County Water District and Zone 7 Water Agency have unique legislative status under SGMA (along with 14 other agencies in California) as being exclusive local agencies within their respective boundaries with powers to comply with SGMA. East Bay Municipal Utility District and the City of Hayward are working together to develop a Groundwater Sustainability Plan for the East Bay Plain Subbasin (part of larger Santa Clara Valley Basin) (East Bay Municipal Utility District, 2019) (ACWD, 2019) (City of Hayward, 2018) (Zone 7 Water Agency, 2005).

4.2.5 - PROJECTED SERVICE DEMAND

Major water services providers with 3,000 or more customers prepare water demand projections every five years to comply with one of the Urban Water Management Plan's required elements. There are several approaches to forecasting water demand. The simplest approach is to apply per capita water use rates to projected population and employment levels; a variant of this approach is to project growth in proportion to the growth in developed acres by land use category. More sophisticated approaches account for conservation effects through end-use modeling or for pricing and supply effects through econometric models. The water agencies in Alameda County use these approaches for projecting water demand.

Overall, potable water demand is projected to increase from 3,52,927 acre-feet in 2015 to 421,331 acre-feet by 2040, as shown in Table 4-7. The table provides projected water demand for water retailers.

DSRSD and Zone 7 project relatively rapid growth in water demand, with DSRSD's demand nearly doubling by 2040 and Zone 7's demand increasing by 87.5 percent by 2035 (2040 data was not available). Zone 7 is a wholesaler, not a retailer. ACWD projects relatively slow growth, with a 10.8 percent increase by 2040.

EBMUD projects a more rapid growth from 2015 to 2020 than from 2020 to 2040. The same goes for Pleasanton.

4.3 - Infrastructure Needs or Deficiencies

In the context of water service, infrastructure needs signify water supply, treatment, conveyance, and distribution infrastructure that do not provide adequate capacity to accommodate current or projected demand for service for the region as a whole or for subregions within the County.

**Table 4-7
Past and Projected Potable Water Service Demand (Acre-feet)**

Agency	2015 Demand	2020 Demand	2040 Demand
ACWD	63,400	63,500	70,300
DSRSD	10,024	17,583	20,043
EBMUD	212,827	243,071	257,633
Hayward	26,135	16,140	23,541
Livermore	28,782	29,213	32,391
Pleasanton	11,459	14,632	17,123
Zone 7*	300	300	300
Total	352,927	384,439	421,331

*Zone 7 demand only covers direct retail

Source: ACWD Urban Water Management Plan, DSRSD Urban Water Management Plan, EBMUD Urban Water Management Plan, Hayward Urban Water Management Plan, Livermore Water Master Plan, Pleasanton Urban Water Management Plan, Zone 7 Urban Water Management Plan

4.3.1 - WATER SUPPLY

This section reviews the available water supply in Alameda County. Most of the potable water in Alameda County is imported surface water. The sources for the water agencies in the County are described below.

Mokelumne River

The Mokelumne River water originates in Amador and Calaveras counties. EBMUD collects the runoff and conveys it into the East Bay through its Mokelumne Aqueduct. The aqueduct conveys the Mokelumne River supply from Pardee Reservoir across the Sacramento-San Joaquin River Delta to local storage and treatment facilities. The Mokelumne Aqueduct has a total capacity of 200 mgd by gravity flow and up to 325 mgd with pumping at the Walnut Creek pumping plant (East Bay Municipal Utility District, 2020).

The Mokelumne River provides important habitat for fall-run Chinook salmon, which migrate from the ocean and reach the Mokelumne in late summer and early fall to spawn. EBMUD releases water for the fishery pursuant to a JSA, a settlement agreement with U.S. Fish and Wildlife Service, CDFW, and the District that was incorporated into our FERC hydro license for our Mokelumne River Project. In collaboration with the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Services, EBMUD uses many strategies to protect and enhance Mokelumne River fisheries resources. This includes spawning and rearing habitat restoration, removal of non-native predator fish species, conducting a comprehensive science program, and investing in one of the most modern and productive salmon hatcheries in the Central Valley.

State Water Project

The State Water Project (SWP) transports Feather River water released from Oroville Dam and unregulated flows that have traveled through the Bay-Delta into Alameda County through the South Bay Aqueduct. ACWD and Zone 7 are two agencies that provide water to

Alameda County that have long-term contracts for water service from the Department of Water Resources. The surface water pumped by Zone 7 from the SWP has been used to recharge the groundwater basin, in addition to local runoff.

The supply from this source is generally of variable quality. Over the years, agricultural, industrial, and urban runoff has polluted Bay-Delta waters. Contaminant sources include agricultural drainage, wastewater treatment plant discharges, and urban runoff. Efforts have been made in recent years to decrease the pollution of these waters.

The Bay-Delta is used as a hub of the State's water distribution system and for recreational purposes and shipping cargo through deep-water channels to Stockton and Sacramento. Freshwater from the rivers mingles with saltwater from the Pacific Ocean, creating the West Coast's largest estuary. As a habitat for more than 500 species of wildlife, the Bay-Delta's unique ecosystem supports 20 endangered species, such as the salt harvest Suisun Marsh mouse and the Delta smelt. It serves as a vital migration path for salmon traveling to and from their home streams to the Pacific Ocean. Environmental mandates to protect the resident Delta smelt and the migrating salmon limit State and federal water operations.

There is a proposed upgrade to the State Water Project's infrastructure called the Delta Conveyance Project, which will modernize SWP's conveyance. Because the SWP relies on the Delta's natural channels to convey water, it is vulnerable to earthquakes and sea-level rise. As sea levels continue to rise, the Delta will be faced with increasing saltwater intrusion. Climate change is also expected to affect the type and timing of precipitation. Certain pumping restrictions in the south Delta can prevent the SWP from reliably capturing water when it is available, especially from storm events. The project would add new diversions in the north Delta to promote a more resilient and flexible SWP in the face of unstable future conditions.

Tuolumne River (SFPUC)

SFPUC collects runoff from the Tuolumne River in Yosemite National Park and conveys it through tunnels and pipes into Alameda County and the Bay Area. Spring snowmelt runs down the Tuolumne River, is collected via a dam system, and is stored in the SFPUC's Hetch Hetchy Reservoir. The Modesto and Turlock Irrigation Districts have Tuolumne River rights senior to SFPUC rights. The supply from this source is generally high quality.

Alameda Creek and Niles Cone Groundwater Basin (SFPUC and ACWD)

The Alameda Creek watershed and the Niles Cone Groundwater Basin contribute to the County's water supply. Alameda Creek runoff is distributed both by SFPUC and ACWD. The Alameda Creek watershed contributes surface water supplies captured and stored in two reservoirs: Calaveras and San Antonio. Milpitas and Fremont are to the west, and Pleasanton and Livermore are located to the northeast of the SFPUC watershed lands. Secondary watershed lands also drain into Alameda Creek, but the runoff in this area is not used by SFPUC. SFPUC maximizes the use of local supplies before Hetch Hetchy supply is used.

ACWD uses Alameda Creek runoff to replenish the Niles Cone Groundwater Basin. Alameda Creek runoff is diverted to percolation ponds using inflatable dams. The water percolates into the groundwater basin through the channel bed and through off-stream recharge ponds.

ACWD is restoring fish passage in Alameda Creek by the decommissioning and foundation modifications to one rubber dam (completed in 2010), installing fish ladders at the other rubber dams blocking fish passage (one completed in 2019, the other under construction), and installing screens at diversion pipelines to prevent fish from being trapped in the water supply system (completed in 2014).

Alameda Creek Watershed

The Alameda Creek watershed is an area of roughly 633 square miles, stretching from Mt. Diablo in the north to Mt. Hamilton in the south and east to Altamont Pass. The area is populated by more than 200,000 people living in seven cities: Dublin, parts of Danville, San Ramon, Livermore, Pleasanton, Fremont, Union City, and thousands more living in unincorporated areas. Only about seven percent of the total acreage is used for residential, commercial, and industrial purposes (ACWD, 2020).

Runoff from the southern region of the watershed is collected in Calaveras and San Antonio reservoirs, which are part of San Francisco's water system. Runoff from much of the southeast portion is collected in the Del Valle Reservoir, some of which is diverted to ACWD via the South Bay Aqueduct. Runoff from the northern region flows to tributaries of Alameda Creek, some of which recharges the Livermore-Amador Valley Groundwater Basin, and the remainder is carried to ACWD facilities and used for groundwater recharge.

Much of ACWD's distribution system supply originates in the Alameda Creek watershed. Rainwater runoff from the watershed and a portion of the State water supply is captured behind two large, inflatable rubber dams which span the width of the Alameda Creek Flood Control Channel. These dams divert water to several hundred acres of ponds (former gravel quarries) where water percolates to recharge the underlying Niles Cone Groundwater Basin.

ACWD continuously samples, analyzes, and monitors the quality of water in Alameda Creek located at the mouth of Niles Canyon near Mission Boulevard and at other key locations throughout the watershed. In addition, ACWD works with property owners and other agencies to encourage the proper use of watershed lands so that the water quality in the creek is protected and maintained.

Bay-Delta Plan Implementation

Because the Bay-Delta ecosystem is so important, environmental regulations and recent actions by the California State Water Resources Control Board to increase unimpaired flows through the Delta to protect this ecosystem will greatly impact the water supply available from the Bay-Delta, as well as the Mokelumne and Tuolumne supplies.

As a result of the restrictions in the Delta, the concerns with water quality, and the variability of imported water supplies due to climate change, the agencies in the Bay Area and in Alameda County are exploring more diversified water supply portfolios and looking to regional and local supplies, such as recycled water and desalination.

4.3.2 - FACILITY CAPACITY AND CONDITION

In this section, the report reviews the capacity and condition of major water facilities.

Major water facilities include water treatment plants (WTPs), reservoirs, and distribution systems. The major facilities, along with capacity and condition, are listed in Table 4-8. Facility condition ratings are based on the review of agency documents and agency-self assessment.

The primary EBMUD treatment facility serving Alameda County is the Orinda WTP. The plant is the largest in the area with a capacity of 175 million gallons per day (mgd) and was most recently rebuilt in 1998. The District describes the facility as in good condition. EBMUD is planning the Orinda WTP Disinfection Improvements Project from 2021–2025 (EBMUD, 2019). The project will improve current water treatment processes by adding ultraviolet (UV) disinfection and a chlorine contact basin. The project includes demolition of an existing maintenance building and construction of a new disinfection facility comprised of a new above-ground two-story maintenance and ultra-violet electrical (MAUVE) building.

The last Municipal Service Review (MSR) from 2005 described the SFPUC Calaveras Reservoir's condition as poor (Burr Consulting, 2005). Since then, SFPUC has completed an \$823 million project to create a new Calaveras Dam, which has increased the reservoir's capacity. The total volume of the dam is approximately 3.5 million cubic yards, which restored the original reservoir capacity of 96,850 acre-feet, or 31 billion gallons of water (San Francisco Water Power Sewer, 2019). Also, a \$1.6 million project called "Calaveras Reservoir Upgrades" was completed in 2006 (San Francisco Water Power Sewer, 2011–2018). Due to these two projects, the condition of the reservoir is now "good" instead of "poor."

The last MSR also described the SFPUC Crystal Springs Reservoir as poor (Burr Consulting, 2005). Since then, SFPUC has completed a \$34.9 million project called "Lower Crystal Springs Dam Improvements." The project was implemented to "lift the operating restrictions on Crystal Springs Reservoir... and to restore the reservoir's historical storage capacity" (San Francisco, City and County, 2010). The project was completed in 2012. Due to the completion of this project, the condition of the reservoir is now "good" instead of "poor."

Zone 7 is planning a large facility for water management and related purposes, known as the Chain of Lakes (COLs) Project. The COLs will ultimately consist of 10 lakes, named A through I and Cope Lake, which could be used for agency objectives, such as stormwater detention, groundwater recharge, education/passive recreation, habitat conservation, and recycled water storage (Zone 7 Water Agency, 2014). The project is planned for decades in the future.

**Table 4-8
Major Potable Water Facilities**

Operator	Facility	Type	Capacity	Condition	Year Built
ACWD	Mission San Jose	WTP	10 mgd	Currently Decommissioned	1975
ACWD	WTP No.2	WTP	26 mgd	Good	1993
ACWD	Newark Desalination Facility	Desalination	12.5 mgd	Good	2003
ACWD	Blending Facility	Water Blending	60 mgd	Good	1992
EBMUD	Orinda	WTP	175 mgd	Good	1935
EBMUD	Upper San Leandro	WTP	60 mgd	Good	1927
EBMUD	Lafayette	WTP	35 mgd	Good	NP
EBMUD	Lafayette	Reservoir	4300 af	Good	1933
EBMUD	Sobrante	WTP	60 mgd	Good	1960s
EBMUD	San Pablo	WTP	50 mgd	Good	1921
EBMUD	Walnut Creek	WTP	115 mgd	Good	1967
EBMUD	Moraga	Pumping plant	58 mgd	Good	1975
EBMUD	Camanche	Reservoir	417,000 af	Good	1964
EBMUD	Pardee	Reservoir	197,950 af	Good	1929
EBMUD	Briones	Reservoir	58,961 af	Good	1964
EBMUD	Upper San Leandro	Reservoir	38,905 af	Good	1926
EBMUD	San Pablo	Reservoir	38,600 af	Fair	1920
EBMUD	Chabot	Reservoir	10,350 af	Good	1875
SFPUC	Sunol Valley	WTP	160 mgd	Good	1966
SFPUC	Harry W. Tracy	WTP	140 mgd	Fair	1971
SFPUC	Hetch Hetchy	Reservoir	360,000 af	Fair	1920s
SFPUC	Calaveras	Reservoir	96,850 af	Good	2019
SFPUC	San Antonio	Reservoir	50,000 af	Fair	1965
SFPUC	Crystal Springs	Reservoir	69,300 af	Good	1877
SFPUC	San Andreas	Reservoir	19,000 af	Fair	1870
SFPUC	Alameda Siphons	Pipeline	NA	Good	2013
SFPUC	Irvington Tunnel	Tunnel	8.5 ft diameter	Good	2013
Zone 7	Del Valle	WTP	36 mgd	Good	1975
Zone 7	Patterson Pass	WTP	12 mgd	Good ¹⁸	1962
Zone 7	Chain-of-Lakes (planned)	Storage	100,000 af	NA	Future
State DWR	Lake Del Valle Reservoir ¹⁹	Reservoir	77,100 af	Good	1968
Zone 7	Patterson Reservoir	Reservoir	100 af	Good	1962

Note: NA: Not Applicable

¹⁸ Zone 7 is in the construction phase to expand the Patterson Pass Water Treatment Plant from 12 mgd to 24 mgd capacity as part of the PPWTP Upgrades and Ozonation Project. This project is anticipated to be completed in 2022.

¹⁹ Serves Zone 7 and ACWD.

Retail water providers store smaller quantities of potable water as reserves. On average, the water retailers, ACWD, Cal Water, DSRSD, and the cities of Hayward, Livermore, and Pleasanton have enough storage capacity to accommodate the average daily water demand for at least 1.5 days. DSRSD is able to accommodate the average daily demand for the least amount of time, 1.5 days, as the agency’s storage capacity is 42.3 million gallons per day, and the average daily demand is 27.5 million gallons per day.

Infrastructure Assessment

The following section presents water-related infrastructure needs and deficiencies for each water retailer. The information is based on a review of the water providers’ Capital Improvement Plans and Master Plans, regulatory information, and agency self-assessment.

**Table 4-9
Retailer Storage Capacity and Daily Demand**

Agency	Storage Capacity	Average Daily Demand
Pleasanton	34.2 MG	16.3 MG
Livermore	25.2 MG	4 MG
Hayward	29.3 MG	15.2 MG
DSRSD	42.3 MG	27.5 MG
Castlewood	1 MG	0.4 MG
ACWD	85.71 MG	48 MG

Sources: Urban Water Management Plans of Pleasanton, Livermore, Hayward, DSRSD, SFPUC, Cal Water (Livermore District), and ACWD

EBMUD

EBMUD has completed seismic upgrades for San Pablo and Chabot dams. The District has allocated \$332.8 million in 2020 for its water systems (East Bay Municipal Utility District, 2020/21).

SFPUC

As of August 2018, the SFPUC’s Water System Improvement Program (WSIP), which is a \$4.8 billion multiyear capital program to upgrade the regional and local water systems, was over 96 percent complete (San Francisco Public Utilities Commission, 2018). The only major regional project that remains in pre-construction is the Alameda Creek Recapture Project.

ACWD

The District is in the midst of upgrading and seismically retrofitting water delivery pipelines and facilities to improve water supply reliability to District customers in the event of a major earthquake. The District is also nearing completion or has completed fish passage projects to restore steelhead trout to Alameda Creek. The projects include the decommissioning and foundation modifications of one rubber dam (completed in 2010), the construction of fish

ladders at two rubber dams (one completed in 2019, the other currently under construction), and the installation of fish screens at all off-stream diversions.

CASTLEWOOD CSA

The District was in the midst of replacing the two existing 100,000-gallon redwood tanks. The existing tanks have leaked extensively in the past and damaged properties below the tank site. Once completed, permanent emergency power sources will be installed at both pump stations.

DSRSD

DSRSD has 334 miles of potable water pipelines, 17 potable pump stations, and 14 reservoirs storing 25 million gallons. They also have a recycled water system that is partially shared with EBMUD, consisting of 72 miles of recycled water pipes, five pump stations, and four reservoirs storing 10.95 mg of recycled water. DSRSD's Asset Management Program identifies projects for the Capital Improvement Program's (CIP) 10-year plan and two-year budget. In addition, it provides an overall estimate of expected expenditures over the CIP Plan timeframe and beyond to guide future rate operating budget and rate studies. Significant projects in DSRSD's CIP include several pipeline replacements projects, replacement of system valves and blow-offs, rehabilitation of a pump station, recoating of two potable water reservoirs, and the installation of emergency generators at critical potable water pump stations. DSRSD also plans to build new infrastructure to accommodate growth in its service areas, including two new reservoirs and an additional connection with its water wholesaler. DSRSD also has a \$40 million program for projects to increase water supply.

CITY OF HAYWARD

Hayward's focus is on continuing to improve system reliability through retrofit, replacement, and strengthening of major infrastructure, including reservoirs, pipelines, and pump stations.

CAL WATER

Within the Livermore District, Cal Water has proposed a series of projects, including 23,416 feet of pipeline replacement, three new emergency generators, four new storage tanks, and booster pump station upgrades. In 2018, Cal Water Service Group filed a proposal to invest \$828.5 million in its California water systems between 2019 and 2021 (Globe Newswire, 2018).

CITY OF LIVERMORE

The City has planned for the replacement of the Dalton water storage tank with a new larger 3.4-million-gallon potable water storage tank. Future projects per the CIP include a number of projects to enhance the capacity of the City's existing water storage, to improve the water

distribution system to enhance fire-fighting capabilities, to repair existing transmission pipes, and to upgrade security for the water system facilities.

CITY OF PLEASANTON

The City has a series of projects in its CIP for the next two years. Water system improvements include water distribution and well improvements; rehabilitation, repair, and decommissioning of water tanks; and development of a water asset management plan.

DSRSD, City of Pleasanton, Zone 7 Water Agency, and City of Livermore are signatories to the Tri-Valley Intergovernmental Reciprocal Services Agreement, an interagency agreement that provides for shared resources and efforts.

Opportunities for Shared Facilities

Municipal water providers practice extensive facility sharing and regional collaboration. The water systems throughout the region are interconnected. Providers receiving water supplies from a common source share storage and conveyance facilities. Emergency interties connect neighboring providers with backup supplies. Multiagency cooperation is common practice for planning efforts, emergency preparedness, and recycled water provision. Both ACWD and Zone 7 engage in multiagency groundwater banking for drought contingencies through the Semitropic Water Storage District. Arroyo Del Valle runoff is stored in Lake Del Valle and made available by DWR through operating agreements with Zone 7 and ACWD.

EBMUD

EBMUD and the Sacramento County Water Agency are members of the Freeport Regional Water Authority, a JPA formed to promote water reliability, reduce drought rationing, and promote conjunctive use in Sacramento by drawing on Sacramento River water south of the City of Sacramento. The District is a participant in the DSRSD-EBMUD Recycled Water Authority formed to increase the amount of recycled water delivered in Dublin and the San Ramon Valley. EBMUD is a member of the Bay Area Clean Water Agencies (BACWA) and has entered into a Multiagency Mutual Assistant Agreement with Los Angeles Department of Water and Power (LADWP) and with Las Vegas Valley Water District (LVVWD). EBMUD also has emergency interties with the Contra Costa Water District (CCWD), DSRSD, and the City of Hayward.

SFPUC

SFPUC has interties with EBMUD and the City of Hayward. They constructed the Skywest Pump Station and 1.5 miles of pipeline to link their system. EBMUD and SFPUC own these facilities jointly. SFPUC and SCVWD share a 40 mgd intertie as well. SFPUC is a member of the Bay Area Clean Water Agencies (BACWA). SFPUC has joint ownership, operation, and management of the Bay Area Regional Desalination Project with Zone 7, EBMUD, CCWD, and SCVWD.

ZONE 7

Zone 7 is a member of the Bay Area Water Agencies Coalition. The South Bay Aqueduct is shared with ACWD and Santa Clara Valley Water District. Zone 7 participates in multiagency groundwater banking of drought supplies through the Semitropic Water Storage District and Cawelo Water District. Zone 7 is a future partner of the Bay Area Regional Desalination Project with EBMUD, SFPUC, CCWD, and SCVWD. Zone 7 also partners with other Bay Area water agencies on the Los Vaqueros Reservoir Expansion project.

ACWD

ACWD has emergency interties with Milpitas and Hayward. The District shares the South Bay Aqueduct with Zone 7 and Santa Clara Valley Water District. ACWD shares storage with Zone 7 in DWR's Del Valle Reservoir. ACWD participates in multiagency groundwater banking of drought supplies through the Semitropic Water Storage District.

CASTLEWOOD CSA

The CSA relies on SFPUC for water supply and contracts with the City of Pleasanton for operations and maintenance. The CSA has emergency interties with the City of Pleasanton.

DSRSD

The District has emergency interties with EBMUD, Pleasanton, and Livermore. The District is a participant in the DSRSD-EBMUD Recycled Water Authority (DERWA), formed to increase the amount of recycled water delivered in Dublin and the San Ramon Valley. DSRSD and EBMUD jointly operate a recycled water treatment facility. Additionally, DERWA provides recycled water on a wholesale/contract basis to the City of Pleasanton.

DSRSD, City of Pleasanton, Zone 7, and City of Livermore are signatories to the Tri-Valley Intergovernmental Reciprocal Services Agreement, an interagency agreement that provides for shared resources and efforts. This agreement was submitted for and won the CALAFCo 2015 Government Leadership Award. Prominent examples of cooperative efforts under this master Tri-Valley agreement include the Tri-Valley Joint Potable Reuse Technical Feasibility Study completed in 2018 under the authority of this agreement. Lastly, the City of Livermore, DSRSD, Zone 7, and the City of Pleasanton executed a 2020 Task Order to provide operational and emergency utility support during the COVID-19 pandemic.

Since 2014, the six water agencies of the Tri-Valley have worked together on the Tri-Valley Water Policy Roundtable and Water Liaison meetings, a regular meeting of elected and appointed officials of Zone 7 Water Agency, City of Pleasanton, City of Livermore, DSRSD, and the California Water Service Company. As a result of these regular policy meetings, a number of collaborative efforts have proceeded under the Tri-Valley Intergovernmental Reciprocal Services Agreement, including studies for a joint potable reuse project.

CITY OF HAYWARD

The City of Hayward has emergency interties with ACWD and EBMUD. Hayward's facilities are used to convey water between EBMUD and SFPUC when the Skywest Pump Station/Emergency Intertie is activated.

CAL WATER

Cal Water has emergency interties with Livermore and is a member of Tri-Valley Water Retailers.

CITY OF LIVERMORE

The City of Livermore has emergency interties with Cal Water. As stated above, the City is a member of Tri-Valley Water Retailers, coordinating with DSRSD, Pleasanton, and Zone 7.

CITY OF PLEASANTON

The City of Pleasanton interconnects with DSRSD and is a member of Tri-Valley Water Retailers. Pleasanton has one emergency intertie with the City of Livermore at El Carro and Stoneridge. Pleasanton also contracts with DERWA for recycled water and has an agreement with the City of Livermore to supply recycled water in areas in Pleasanton along its eastern city boundary using wastewater from the Ruby Hill area.

BAY AREA REGIONAL RELIABILITY DROUGHT CONTINGENCY PLAN

One of the more recent efforts in regional collaboration has been the development of the Bay Area Regional Reliability Drought Contingency Plan. The Bay Area's largest water agencies are working together to develop a regional solution to improve the water supply reliability for over six million area residents and the thousands of businesses and industries located therein. The Bay Area Regional Reliability (BARR) Partners include Alameda County Water District, Bay Area Water Supply and Conservation Agency, Contra Costa Water District, East Bay Municipal Utility District, Marin Municipal Water District, San Francisco Public Utilities Commission, Santa Clara Valley Water District, and Zone 7 Water Agency. The BARR Partners have joined forces to leverage existing facilities and, if needed, build new ones to bolster regional water supply reliability. The Drought Contingency Plan recommended pursuing several projects to increase water supply reliability, including interties between agencies, expansion of Los Vaqueros reservoir, and further study of a Bay Area Regional Desalination Facility.

The Bay Area's five largest water agencies, the Contra Costa Water District, EBMUD, SFPUC, the Santa Clara Valley Water District, and Zone 7, are jointly exploring a regional desalination project that would provide an additional water source, diversify the area's water supply, and foster long-term regional sustainability. The main goal is to locate a 10 to 20 million gallons per day desalination treatment facility in eastern Contra Costa County to turn brackish water into a reliable, drought-tolerant drinking water supply. The desalination facility would

operate in all year types, serving the all-weather needs of the SFPUC and Zone 7 and banking the excess production for the agencies' dry year needs (Bay Area Regional Desalination Project, 2013). EBMUD's current role in the regional desalination plan is limited to potentiality wheeling water for the Bay Area agencies that are evaluating the project.

4.4 - Service Standards and Adequacy

In order to assess infrastructure deficiencies and needs, it is necessary to analyze the adequacy of the facilities and related services in meeting the needs of the population. Adequacy can be gauged by such measures as compliance with drinking water standards, drought preparedness, emergency preparedness, response time for water emergencies, adequate water pressure, and system integrity.

4.4.1 - WATER QUALITY

There are a number of threats to drinking water, including improperly disposed of chemicals, animal wastes, pesticides, human wastes, wastes injected deep underground, and naturally occurring substances that can all contaminate drinking water. Likewise, drinking water that is not properly treated or disinfected or which travels through an improperly maintained distribution system may also pose a health risk.

THREAT TO QUALITY - PFAS

Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) are unregulated synthetic chemicals that are part of a larger group of chemicals referred to as per- and polyfluoroalkyl substances (PFAS). PFAS are manmade substances that are resistant to heat, water, and oil commonly used in fire-fighting foams and a wide range of industrial and consumer products. Exposure to these chemicals over certain levels may cause adverse health effects. Manufacturers have attempted to develop replacement technologies in the PFAS family. While less information is available, studies have shown the replacement technologies have a similar impact as the original substance.

PFAS can contaminate drinking water supplies when products containing them are used or spilled on the ground, and the PFAS migrates into groundwater. Both the federal and State governments have regulations regarding PFAS. In addition, the water agencies of Alameda County have also taken a proactive approach to PFAS. According to their websites, Pleasanton, ACWA, EBMUD, and Zone 7 all voluntarily monitor PFAS.

AGENCY STANDARDS FOR QUALITY

The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water. The law requires many actions to protect drinking water and its sources, rivers, lakes, reservoirs, springs, and groundwater wells and applies to public water systems serving 25 or more people. It authorizes the U.S. Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both

naturally occurring and manmade contaminants and to oversee the states, localities, and water suppliers that implement the standards.

EPA drinking water standards are developed as a maximum contaminant level (MCL) for each chemical or microbe. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure, based upon toxicity data and risk assessment principles. The EPA's goal in setting MCLs is to assure that even small violations for a period of time do not pose a significant risk to the public's health over the long run.

The California State Water Resources Control Board (State Water Board) Division of Drinking Water (DDW) is the primary agency responsible for the administration and enforcement of the SDWA requirements in California (California Division of Drinking Water, 2018).

The State Water Board and the Division of Drinking water oversee the implementation of the Safe Drinking Water Act. In addition to the federal standards, California also imposes an MCL standard for the fuel additive MTBE and for a rice herbicide breakdown product used in the Sacramento Valley. Health violations occur when the contaminant amount exceeds the safety standard (MCL) or when water is not treated properly. Monitoring violations involve failure to conduct or to report in a timely fashion the results of required monitoring. A significant monitoring violation occurs when the system fails to take a large percentage of the required samples.

Water Quality Violations

Within Alameda County, there was one water quality violation since the completion of the last Municipal Services Review. The violation occurred at the water system of the Norris Canyon Property Owners Association (California State Water Resources Control Board, 2017). This water association serves 65 people in Alameda County, and groundwater is the primary source of water. Nitrate was found in the water system in 2016. In 2017, enforcement actions were taken for the nitrate found in 2016. This water system should be monitored in future years to make sure that no contaminants enter the system, and the Norris Canyon Property Owners Association should consider steps to diversify its water supply.

Of the major water providers discussed in this report, there have been no health or monitoring violations since 1998.

4.4.2 - DROUGHT PREPAREDNESS AND SUSTAINABILITY

Significant droughts affecting Alameda County water consumers occurred from 1976–1977, 1988–1991, and most recently 2011–2019 (National Integrated Drought Information System, 2020). In most drought years, the drought ranges from categories D-0(abnormally dry) to D-2(severe drought). In 2014–2017, however, the drought reached a category D-4. To prepare for droughts, agencies store water during wet years, acquire supplemental drought supplies, and conduct planning efforts.

Urban water suppliers are required by the Urban Water Management Planning (UWMP) Act to prepare a water shortage contingency plan that describes and evaluates sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule, and other relevant information programs. They must update their UWMP and submit a complete plan to DWR every five years. A UWMP is required for a water supplier to be eligible for DWR-administered State grants and loans and drought assistance. DWR has no regulatory permitting or other approval authority over the plans.

Each of the major providers must report its water shortage contingency plan in the UWMP, including the expected water supply in a multiyear drought, the water rationing approach, and the stages of action the supplier will take in response to a water supply shortage. Rationing requirements should be reasonable and encourage consumption reductions by consumers. A typical rationing sequence would begin with voluntary rationing. In the second or third year of an extended drought, mandatory rationing might be expected. All the water providers in Alameda County must comply with the UWMP requirements and prepare a water shortage contingency plan every five years. As of the last MSR, the City of Livermore had not released a UWMP, but in 2015 the City released one.

Drought plans and storage practices for each of the water retailers are listed in Table 4-10.

**Table 4-10
Agency Drought Plans and Storage Practices**

Agency	Drought Plan Overview	Storage Practices
ACWD	The District will use water stored in local aquifers and offsite storage at the Semitropic Water Storage District's Groundwater Banking Program.	The District's Semitropic Groundwater Banking Program provides 150,000 acre-feet of groundwater storage capacity.
Cal Water	Zone 7 will draw on water stored in the main basin in the Livermore Valley Groundwater Basin and the Semitropic Banking Program. Cal Water has a four-stage rationing plan.	Zone 7's operational storage of its main basin is 126,000 acre-feet. The total capacity is 254,000 acre-feet, so the remaining 128,000 acre-feet is considered emergency reserve storage. Zone 7 has contracts for storing water in Semitropic and Cawelo Groundwater Banking Programs, with total storage capacity rights of over 300,000 af.
Castlewood CSA	SFPUC water supply does not have a backup system other than two pumps. An emergency interconnection with the City of Pleasanton exists for temporary service. The CSA is exploring a permanent	SFPUC uses a series of reservoirs for storage.

Agency	Drought Plan Overview	Storage Practices
	interconnection with the City of Pleasanton in the future. SFPUC has a Retail Water Shortage Allocation Plan.	
DSRSD	Zone 7 will draw on water stored in the main basin in the Livermore Valley Groundwater Basin and the Semitropic Banking Program.	<p>Zone 7’s operational storage of its main basin is 126,000 acre-feet. The total capacity is 254,000 acre-feet, so the remaining 128,000 acre-feet is considered emergency reserve storage.</p> <p>Zone 7 has contracts for storing water in Semitropic and Cawelo Groundwater Banking Programs, with total storage capacity rights of over 300,000 af.</p>
EBMUD	The District’s most recent Urban Water Management Plan and Water Shortage Contingency Plan both have information related to drought resiliency.	EBMUD’s total system storage includes Pardee, Camanche, Upper San Leandro, Briones, Lafayette, Chabot, and San Pablo reservoirs.
Hayward	The City has implemented a Drought Implementation Plan which has been developed in cooperation with other wholesale customers of SFPUC water. The plan allocates available water among wholesale customers in the event of a declared drought situation.	The City has limited storage within the city limits. The water flows from the SFPUC system to Hayward through two pipelines that are looped, so the entire City has redundant water supply lines. The water is then pumped up to a series of reservoirs and pump stations known as the Highland Chain to supply water to the homes and businesses in the Hayward Hills.
Livermore	Zone 7 will draw on water stored in the main basin in the Livermore Valley Groundwater Basin, and the Semitropic Banking Program.	<p>Zone 7’s operational storage of its main basin is 126,000 acre-feet. The total capacity is 254,000 acre-feet, so the remaining 128,000 acre-feet is considered emergency reserve storage.</p> <p>Zone 7 has contracts for storing water in Semitropic and Cawelo Groundwater Banking Programs, with total storage capacity rights of over 300,000 af.</p>
Pleasanton	Zone 7 will draw on water stored in the main basin in the Livermore Valley	Zone 7’s operational storage of its main basin is 126,000 acre-feet.

Agency	Drought Plan Overview	Storage Practices
	Groundwater Basin and the Semitropic Banking Program.	The total capacity is 254,000 acre-feet, so the remaining 128,000 acre-feet is considered emergency reserve storage. Zone 7 has contracts for storing water in Semitropic and Cawelo Groundwater Banking Programs, with total storage capacity rights of over 300,000 af.
SFPUC	SFPUC has a Retail Water Shortage Allocation Plan.	SFPUC recently completed the Alameda Creek Recapture Project, Lower Crystal Springs Dam Improvements Project, the Regional Groundwater Storage and Recovery Project, and the Lake Merced Water Level Restoration Project in order to store water for a drought.
Zone 7	Zone 7 will draw from its storage reserves during droughts, which include the local groundwater basin, Del Valle Reservoir, San Luis Reservoir, and groundwater banks in Kern County.	Zone 7's operational storage of its main basin is 126,000 acre-feet. The total capacity is 254,000 acre-feet, so the remaining 128,000 acre-feet is considered emergency reserve storage. Zone 7 has contracts for storing water in Semitropic and Cawelo Groundwater Banking Programs, with total storage capacity rights of over 300,000 af.

Sources: Drought Preparedness Chapter of each agency's Urban Water Management Plan

Every major water provider has a drought preparedness plan and storage options were a drought to occur. With the recent severe drought from 2011 to 2019 (mostly from 2014 to 2017), water agencies were forced to enact their drought preparedness programs.

In the event of an extended drought, the water suppliers might be required to implement mandatory rationing of water. Rationing plans prioritize human consumption of water before outdoor uses for agriculture, irrigation, and landscaping. In the most critical drought stage in EBMUD's UWMP (stage 4), a mandatory 15 percent customer demand reduction is required. For Zone 7, that mandatory reduction is 35 percent. For SFPUC, the mandatory reduction is 20 percent. For ACWD, the mandatory reduction is 50 percent.

4.4.3 - EMERGENCY PREPAREDNESS

The water suppliers are also required by the UWMP Act to address catastrophic disruptions of water supplies. The plan should look at the vulnerability of each source and delivery and distribution systems to events, such as earthquakes, regional power outages, and system failures. The plan should include specific supplier actions designed to minimize the impacts of supply interruption on the service area. The water providers in Alameda County comply with the UWMP requirement and prepare a catastrophic supply interruption plan every five years.

On October 23, 2018, America's Water Infrastructure Act (AWIA) was signed into law. AWIA Section 2013 requires community (drinking) water systems serving more than 3,300 people to develop or update risk assessments and emergency response plans (ERPs). The law specifies the components that the risk assessments and ERPs must address and establishes deadlines by which water systems must certify to EPA completion of the risk assessment and ERP. The certification deadlines are based on population. Water systems serving more than 50,000 residents but less than 100,000 residents must complete their assessment by December 31, 2020. The assessment must include natural hazards and malevolent acts, the resilience of water facility infrastructure, monitoring practices, chemical storage and handling, and operation and maintenance (Environmental Protection Agency, 2019).

4.4.4 - WATER PRESSURE

Water systems are designed to maintain adequate pressure to both meet potable water demand and provide adequate fire suppression flows, consistent with Department of Public Health and water agency standards. There are no other requirements for water pressure, although customers expect adequate pressure for typical uses.

Although not a regulatory agency, the Insurance Services Office (ISO) considers fire flow availability in determining ISO ratings for jurisdictions. The ISO utilizes a uniform set of criteria called the Fire Suppression Rating Schedule (FSRS) in the creation of its Public Protection Classification (PPC). The PPC is used to rate a community's ability to suppress fires and is based on a survey of water pumps, storage facilities, and filtration systems. Forty percent of the PPC is based on water supply factors, including the amount of supply maintained and the water flow available. Water flow requirements include water flow rate (gallons per minute) and duration and vary throughout a community by building area and construction type. Water flows are assessed through a survey of representative locations within the community.

Table 4-11 shows the ISO ratings of the fire departments in Alameda County. A score of 1 is the best a fire department can get, and 10 is the worst. All the ratings that could be found have an adequate ISO rating. Fremont has improved from its last ISO reporting in 2002, where the rating was a 4; now, the rating is a 3.

Table 4-11
Agency ISO Ratings

Agency	ISO Rating
Alameda County	2
Alameda City	1
Albany	1
Berkeley	1
Fremont	3
Hayward	2
Livermore-Pleasanton	3
Oakland	NA
Piedmont	NA
Dublin	NA

Sources: Alameda County FY 16-17 Budget, City of Alameda's Public Protection Classification Summary Report, Albany Fire Department Report to the Community, the Daily Californian, Fremont News Messenger, Hayward Fire Department, Livermore-Pleasanton Fire Department FY 15-16 & 16-17 Budget Update

4.4.5 - SYSTEM INTEGRITY

Generally speaking, much of the drinking water infrastructure has been in service for decades and can be a significant source of water loss through leaks. In addition to leaks, water can be "lost" through unauthorized consumption (theft), administrative errors, data handling errors, and metering inaccuracies or failure.

Water losses are grouped into two types of loss. There is real loss, which is the physical loss (or leakage) and apparent loss, which is caused by revenue meter under-registration, water theft, and billing errors. While real losses are an expense due to lost water, apparent losses are not so much an expense to the water utility as they are a loss of potential revenue (Rizzo, et al.).

Senate Bill 555 requires each urban retail water supplier to submit a completed and validated water loss audit report for the previous calendar year or previous fiscal year. The law requires the State Water Board to develop water loss performance standards for urban retail water suppliers. As of the time this document's publication, the State Water Resources Control Board is still in the public outreach phase of the formal rulemaking process for the development of water loss performance standards.

The California Department of Water Resources (DWR) has a Water Loss Audit Reporting Program, which uses local water agency data over a defined period to identify water losses. Table 4-12 shows the water loss rates of the agencies in Alameda County per the Audit Reporting Program.

Table 4-12
Agency Water Loss Rate in 2019 (Gallons/Connection/Day)

Agency	Real Loss	Apparent Loss
ACWD	25.66	9.87
Cal Water - Livermore	29.26	10.37
DSRSD	10.68	4.94
EBMUD	37.63	17.70
Hayward	2.85	3.58
Livermore	45.24	7.81
Pleasanton	23.80	13.30
Zone 7	N/A	N/A

Source: https://wuedata.water.ca.gov/awwa_plans

4.5 - Financing Constraints and Opportunities

Service-related financing constraints and opportunities are discussed in this section. The scope includes revenue sources, financing constraints, rates, and connection fees. The section identifies financing, rate restructuring, and cost-avoidance opportunities.

4.5.1 - FINANCING RESOURCES

Water service charges, connection fees, property tax, assessments, and voter-approved measures are significant revenue sources for water enterprises in Alameda County. There is a basic difference in how single service and multiservice agencies collect funds for water enterprises. It appears that multiservice agencies are able to split overhead costs within their rates of multiple municipal services in order to provide lower overall costs for water services, whereas single service agencies must include all overhead within the rate for water service.

About 80 percent of all revenues for these agencies comes from water sales and associated services (see Chart 4-1). The reliance on the sale of water and service furthers the importance of ensuring sustainable and reliable sources in order to keep rates at a reasonable level for customers. Table 4-13 shows the water revenues of the water agencies of California. Information for this table was sourced from the State's Comprehensive Annual Financial Report (CAFR).

Property taxes and assessments comprise only about two percent of total revenues. Property taxes are subject to State constitutional limits established under Proposition 13. Furthermore, these revenues fluctuate with market conditions and do not recover at the same rate which they decline due to Proposition 13. Property assessments are much more stable as they are not subject to property valuation changes. Generally, they are established through the Proposition 218 process and accompanied by some sort of engineering study, which establishes an assessment for a specific purpose to be levied to property owners. That assessment can be adjusted annually with inflation as well, which makes a more reliable revenue source at times than property tax. However, no agency relies more than seven percent on these sources.

Chart 4-1
Water Agency Revenue Sources (2018)

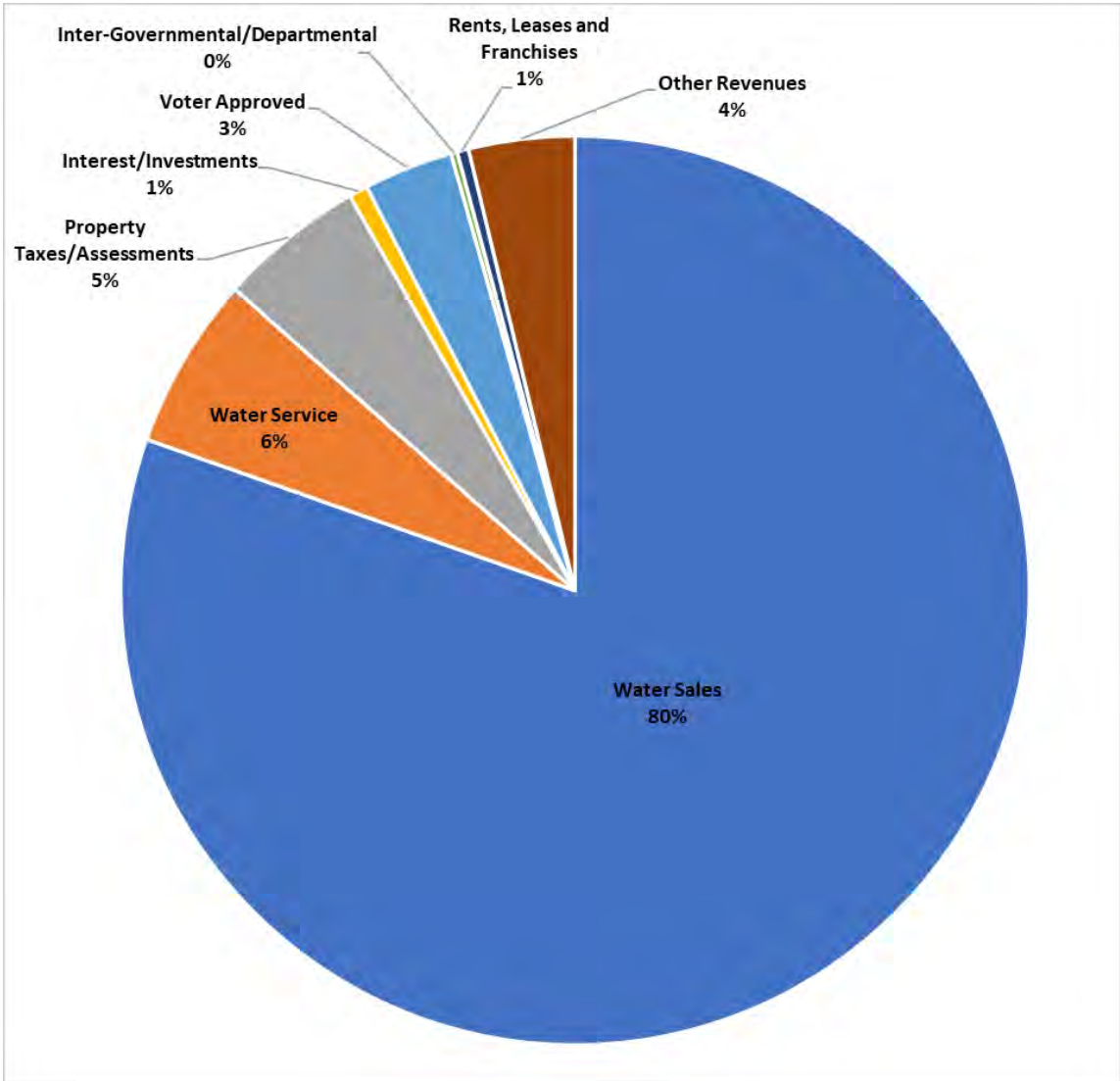


Table 4-13
Water Agency Revenues (2018)

Water Agency	Water Sales	Water Service	Property Taxes/ Assessments	Interest/ Investments	Voter Approved	Inter-Governmental/ Departmental	Rents, Leases and Franchises	Other Revenues	Total
ACWD	\$101,804,000 80%	\$410,000 <1%	\$5,711,000 4%	\$179,000 <1%	\$5,559,000 4%	\$19,000 <1%	\$0 0%	\$13,416,000 11%	\$127,098,000
DSRSD	\$30,429,459 61%	\$12,994,290 26%	\$2,261,528 5%	\$277,116 1%	\$0 0%	\$4,590 <1%	\$0 0%	\$4,228,423 8%	\$50,195,406
EBMUD ²⁰	\$477,896,000 85%	\$24,293,000 4%	\$5,331,000 1%	\$7,941,000 1%	\$35,646,000 6%	\$276,000 <1%	\$0 0%	\$2,848,000 <1%	\$553,955,000
Zone 7	\$47,860,145 36%	\$35,434,462 27%	\$8,518,064 6%	\$2,918,654 2%	\$21,385,641 16%	\$8,649,179 7%	\$142,100 <1%	\$7,154,425 5%	\$132,062,670
Hayward	\$45,301,698 76%	\$14,083,506 24%	\$0 0%	\$466,551 1%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$59,851,755
Livermore	\$15,073,801 100%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$15,073,801
Pleasanton	\$27,392,144 96%	\$277,200 1%	\$0 0%	\$183,500 1%	\$0 0%	\$413,015 1%	\$0 0%	\$386,700 1%	\$28,652,559
Castlewood CSA	0.00%	0.00%	\$852,346 88.20%	\$18,125 1.88%	0.00%	\$95,867 9.92%	0.00%	0.00%	\$966,338
TOTAL	\$745,757,247	\$87,492,458	\$22,673,938	\$11,983,946	\$62,590,641	\$9,457,651	\$142,100	\$28,033,548	\$967,855,529
%	77%	9%	2%	1%	6%	1%	<1%	3%	

²⁰ The numbers for EBMUD include revenues for all the components that constitute 'Water Enterprise' (Power, Fire Protection, and Water Service)

Return on investments is a relatively simple way for agencies to accumulate additional revenue from the revenues or reserves which they have accumulated. However, this amount is again relatively minor as it comprises 1.2 percent of overall revenue for all the water agencies reviewed. Returns are very typical to a bank savings account, with a low of 0.14 percent and a high of 2.29 percent.

Agencies may have specific needs which have been identified or discussed with their customers and residents. These items may be supported with revenues established through a voter initiative, such as a proposition. In many instances, these revenues can match or exceed revenues collected from property taxes or assessments due to the revenues being identified for a specific use, such as improvements or the purchase of water resources. In many instances, that is all the money collected through voter approval can be utilized for.

An interdepartmental or governmental transfer is a minor revenue source for these agencies that involve items such as credits for homeowners living within the district or transfer of money from one department of the agency to the water enterprise. Some of these districts have many other revenue sources which they could essentially loan the water enterprise if needed. However, only 0.2 percent of revenues for these agencies is generated in this fashion.

Franchise, rent, and lease agreements may generate revenues for these agencies but appear to be underutilized as it only generates 0.4 percent of overall revenues. All other revenue sources only comprise four percent of overall revenues. The fact that these sources are not heavily relied upon is important because it is likely that many revenue sources that are categorized as others may be one-time type sources and may not be available in future budgetary years.

4.5.2 - FINANCING CONSTRAINTS

Water providers must maintain an enterprise fund for the water utility separate from other funds and may not use water utility revenues to finance unrelated governmental activities. Local agencies providing water services are required to maintain separate enterprise funds to ensure that water-related finances are not commingled with the finances of other enterprises, such as wastewater. Furthermore, cities providing water service must account for water enterprise finances separately from their general funds. Cities may not use the water enterprise fund to finance general fund activities. Conversely, it is not illegal for a city to use general funds to support the water enterprise but is generally not favorable as it shows that the enterprise is not solvent and cannot support itself based on its current rate and operations structure.

The boards of each of the public sector water providers are responsible for establishing service charges. Service charges are restricted to the amount needed to recover the costs of providing water service. The water rates and rate structures are not subject to regulation by other agencies. The agencies can and often do increase rates annually. Generally, there is no voter approval requirement for rate increases or for the issuance of water revenue bonds. However, some agencies have had voter approval for additional revenues to support the

districts' water enterprise, which typically comprises a small portion of the overall revenue funding and is typically restricted to a specific set of uses, such as additional water purchases.

Similarly, connection fees for water providers are established by each of the respective boards to recover the costs of extending infrastructure and capacity to new development. The fees must be reasonable and may not be used to subsidize operating costs. In the case of private utility companies, such as Cal Water, the California Public Utilities Commission establishes connection fees.

Financing constraints are comprised of various State constitutional and statutory provisions that establish various limits to how revenue can be generated by local agencies.

Proposition 13

Proposition 13 was approved by the California voters in 1978 and established the following limits:

- Limits property tax rate to one percent of full market value.
- Caps the increase in property value at two percent with reassessment at full market value only upon change of ownership.
- Requires two-thirds voter approval to raise "special taxes."

Although Proposition 13 achieved its goal of reducing the tax burden of residents and property owners, it reduced property tax revenues by nearly 60 percent (Coleman). The challenges of local agencies to achieve a two-thirds approval of the electorate base to levy special taxes is difficult and requires a very pointed, coordinated effort of the agency to achieve concurrence with residents that the needed additional revenue is actually required and cannot be achieved with current financing resources. The outreach and concise communication with customers and residents can be extensive in order to achieve success for an additional special tax.

Furthermore, the revenues generated through property taxes may decline at higher rates than they may increase. As a result, losses may take longer to recover from, and the inability to fund essential services may be more likely if agencies highly rely on property taxes. However, given that agencies on average only rely on 2.33 percent of their revenues from property taxes, interruptions in essential services are much less likely.

Proposition 218

Proposition 218 was approved by the California voters in 1996 and established voter thresholds for how agencies may establish taxes and property assessments. Furthermore, Proposition 218 limited agencies to only being able to establish these taxes and property assessments for only the cost of providing the identified services. Exceeding the cost of service is not legal (Coleman).

Depending on the agency and the service provided, voters must approve the proposed tax or assessment with a majority or super-majority of the electorate. In some cases, the assessed value of the property may be used to establish the voting weight of each property owner.

As with Proposition 13, any proposed special tax or assessment would require extensive public outreach and a coordinated effort in order to educate and build support for additional revenue funding by customers. Traditionally, this has been very difficult for governments to do and has resulted in fees that have not kept pace with actual costs of service.

Proposition 26

Proposition 26 was approved by the California voters in 2010 and may require new fees, or existing fees that are extended or increased, to be classified as special taxes requiring approval by a two-thirds vote of local voters. Local governments must understand, however, that the Proposition 26 provisions applicable to local government contain seven categories of exceptions to this voter-approval requirement. Most fees that cities would seek to adopt will most likely fall into one or more of these exemptions. Further, the local provisions of Proposition 26 only apply to fees imposed, extended, or increased after November 3, 2010. Fees in place prior to this date will not be subject to voter approval. Proposition 26 is aimed at a particular class of fees imposed by State, and local governments, commonly referred to as “regulatory fees.”

The limitation of Proposition 26 requires all agencies to carefully ensure fees fall into one of the seven exemptions, listed as follows:

1. **Specific Benefit Exemption:** A charge imposed for a specific benefit conferred or privilege granted directly to the payor that is not provided to those not charged and which does not exceed the reasonable costs to the local government of conferring the benefit or granting the privilege.
 - Examples: planning permits, police permits, street closure permits, parking permits in restricted zones, some franchises.
2. **Specific Government Service or Product Exemption:** A charge imposed for a specific government service or product provided directly to the payor that is not provided to those not charged and which does not exceed the reasonable costs to the local government of providing the service or product.
 - Examples: user fees including for utilities (most retail water, sewer, trash, and stormwater fees are exempt under exemption #7, being subject to Proposition 218), public records copying fees, DUI emergency response fees, emergency medical and ambulance transport service fees, recreation classes.
3. **Permits and Inspections Exemption:** A charge imposed for the reasonable regulatory costs to a local government for issuing licenses and permits, performing

investigations, inspections, and audits, enforcing agricultural marketing orders, and the administrative enforcement and adjudication thereof.

- Examples: fire, health, environmental, safety permits.
4. Local Government Property Exemption: A charge imposed for entrance to or use of local government property or the purchased rental or lease of local government property.
 - Examples: facility rental fees, room rental fees, equipment rental fees, on and off-street parking, tolls, franchise.
 5. Penalty for Illegal Activity Exemption: A fine, penalty, or other monetary charge imposed by the judicial branch of government or a local government as a result of a violation of law, including late payment fees, fees imposed under administrative citation ordinances, parking violations.
 - Examples: parking fines, code enforcement fees and penalties, late payment fees, interest charges, and other charges for violation of the law.
 6. Property Development Exemption: A charge imposed as a condition of property development.
 - Examples: planning, CEQA, and building permit fees, construction permits, development impact fees, fees imposed to remedy the effects of the fee payor's operation that are imposed as a condition of property development.
 7. Proposition 218 Exemption: Assessments and property-related fees imposed in accordance with the provisions of Article XIII D.
 - Examples: assessments on real property for the special benefit conferred, fees imposed upon a parcel or a person as an incident of property ownership, and fees for a property-related service, such as many retail water and sewer fees.

As new or existing fees and other charges are adopted by each agency, findings and supporting documentation needs to be provided that justifies consistency with one of these seven exemptions in order to be consistent with Proposition 26 (California League of Cities, 2011).

Development Impact Fees (Mitigation Fee Act)

The Mitigation Fee Act (Government Code Section 66000-66011) was adopted by the California State legislature originally in 1987 to provide project applicants with relief from onerous conditions of approval and to provide a method to properly clarify exactions by local agencies, such as fees and dedications. The bill was crafted as a form of “nexus legislation” in

order to reflect the seminal United States Supreme Court case on nexus and proportionality, *Nollan v. California Coastal Commission*.

These agencies maintain infrastructure that, with new development, may need to be replaced or extended through improvement projects based on impacts of the development. The ability to exact impact fees as a result of the impacts of the projects must be conveyed in a fair share manner through the adoption of impact fees consistent with the premises of the Mitigation Fee Act. The ability to provide financing through new development is directly limited to the direct correlation of the projects' impacts to the infrastructure system.

In 2019, Assemble Bill No. 68 was signed into law. The bill reduces many of the regulations regarding the building of accessory dwelling units. A key provision of the law states that a local agency, special district, or water corporation shall not impose any impact fee upon the development of an accessory dwelling unit less than 750 square feet. Additionally, any impact fees charged for an accessory dwelling unit of 750 square feet or more shall be charged proportionately in relation to the square footage of the primary dwelling unit. This could potentially lead to complications for agencies providing services. The new accessory dwelling units could cause an impact by expanding the need for a larger system to provide services, but the owner of the unit would not have to pay the impact fee for it.

4.5.3 - FINANCING OPPORTUNITIES

On November 5, 1996, the California electorate approved Proposition 218, the self-titled "Right to Vote on Taxes Act." Proposition 218 adds articles XIIC and XIID to the California Constitution and makes numerous changes to local government finance law. Proposition 218 was approved by a 56.6 percent to 43.4 percent vote. It requires voter approval for increases in general or special taxes, special assessments, and other property-related charges. The hurdle of obtaining a majority approval, and in some cases a two-thirds majority, by the electorate, has often limited the ability of agencies to increase revenues. In some cases, critical and unique issues do not require significant outreach to educate the electorate as it has already been publicized or creates a critical issue that residents want to resolve. In other cases, residents may review an increase in assessments or other charges as overreaching. The burden of proof to convince customers and voters is an issue that all agencies must consider when attempting to increase revenues subject to Proposition 218 through the electorate. Because of this, service providers need to look to other sources.

There are two basic types of financing opportunities available to agencies. The first being one-time funds, such as grants that may be used for a strategic need or project that helps to reduce the financial burden on ratepayers within the limits of the agency. These funds are usually competitive and require forward design and planning to be presented for funding from the grant or bond. The second type of funding is ongoing financial resources such as taxes and rates. These funds are available annually through agency collection activities and are adopted through various methods, such as the annual budget or Proposition 218 process. These ongoing funding types are much more significant to the financial health of an agency.

Issuance of Bonds

Agencies may issue bonds to aid with funding infrastructure and improvements. However, the issuance of bonds requires sound budgeting as they become a debt service to the agency for a period of time, typically 20 to 30 years. That debt service must be paid back by the agency in order to maintain a decent credit rating. A decline in credit rating limits the agencies' ability to earn other financial loans or issuance of bonds in the future. The agency may pay off bonds early if resources are available. Agencies may also include bond payments within the rate structure to aid in payback as well, but these increases typically require approval by customers in accordance with Proposition 218.

Drinking Water State Revolving Fund (DWSRF)

The Drinking Water State Revolving Loan Fund (DWSRF) was established by the 1996 amendments to the Safe Drinking Water Act (SDWA). The DWSRF is a financial assistance program to help water systems and states to achieve the health protection objectives of the SDWA. The program is a powerful partnership between EPA and the states.

Building on a federal investment of over \$21.0 billion, the State DWSRFs have provided more than \$41.1 billion to water systems through 2019. This assistance was provided through over 15,425 assistance agreements for:

- Improving drinking water treatment.
- Fixing leaky or old pipes (water distribution).
- Improving the source of water supply.
- Replacing or constructing finished water storage tanks.
- Other infrastructure projects needed to protect public health.

Congress appropriates funding for the DWSRF. EPA then awards capitalization grants to each state for their DWSRF based upon the results of the most recent Drinking Water Infrastructure Needs Survey and Assessment. The State provides a 20 percent match and then makes funds available to agencies through an application process (Environmental Protection Agency, 2020).

Proposition 1 (Statewide Water Bond)

The Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) authorizes \$7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection. Funding is available to local agencies for a variety of water-related projects through a solicitation process (California Natural Resources Agency, 2020).

4.5.4 - RATES

All agencies have adopted rates that fund operations, maintenance, and administrative activities. These rates are adopted through the normal budgeting process and are accompanied by the outlay of agency activities, purchases, infrastructure needs, and expansion that, in turn, are passed to customers for funding for the most part.

Rates are usually divided between multiple customer categories, such as residential, commercial, industrial, non-potable, or recycled.

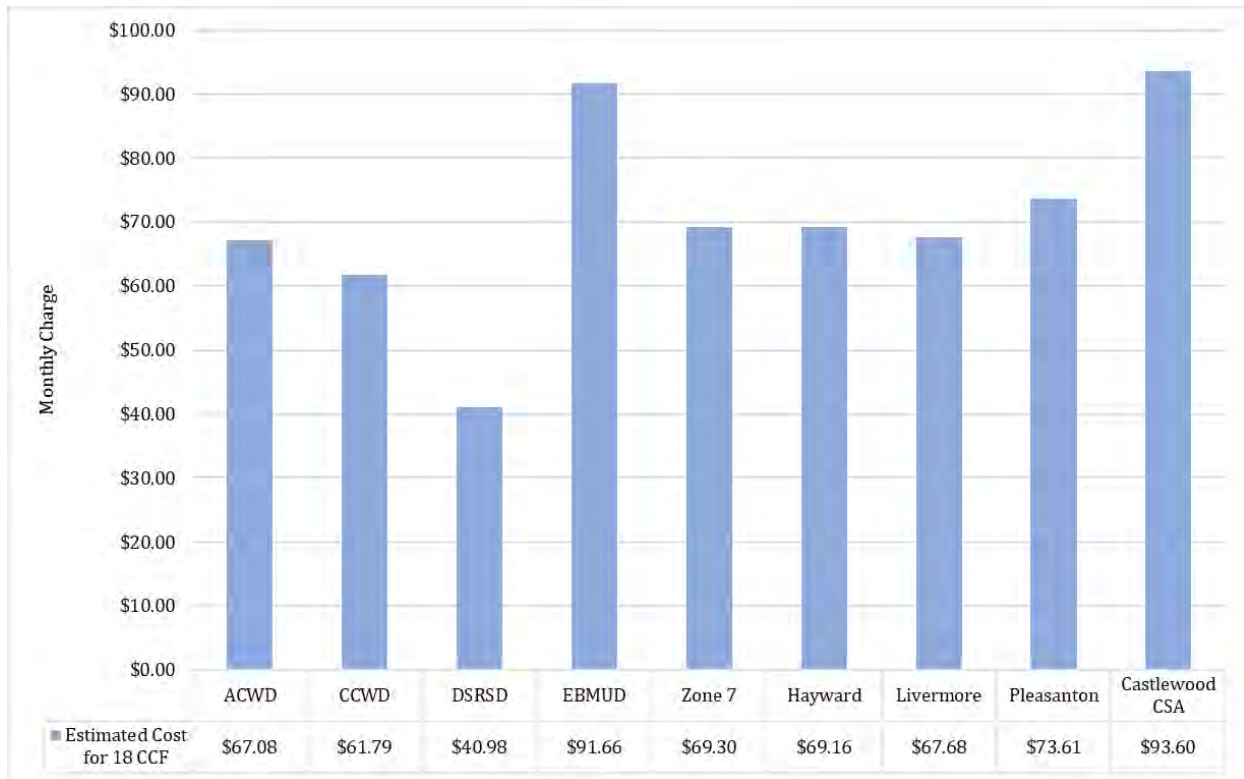
Rate Factors

Water rates are derived through an engineering report that is adopted by each agency that reviews overall operating and maintenance costs throughout the system. Specific improvements and replacement of existing facilities may be placed within the overall rate depending on the benefit to the customer base, or it may be more centralized within a service zone to the specific neighborhood that improvement may benefit, which could lead to different rates throughout the overall agency boundaries.

The overall rate should also include the cost for electricity in addition to the cost to acquire the water, which is to be distributed throughout the service boundary. If water costs go up from a water provider to the agency, that cost must be borne through the rates for the agency to remain solvent financially and continue to operate. For example, the Alameda County Water District included water supply cost increases for their five-year rate increase update in 2017, with some increases in a given year being as high as 13 percent. An agency typically does not subsidize costs to customers without some basis for doing so, such as having a budget surplus in a given year.

Chart 4-2 shows the average rate of the service providers is about \$67.68 based on a usage of 18 units of water, which is equivalent to 100 cubic feet or 748 gallons. Most agencies are near or below the average rate within the region, while two agencies, Castlewood CSA and EBMUD, are both upwards of \$90 per month. EBMUD has various pressure charges due to elevation changes which account for some of the increase in monthly rates. Castlewood CSA is a much smaller service area and customer base that likely does not realize the benefit of economy of scale factors of being to spread fixed costs over more customers, which directly impacts the water rates. Rates shown in the tables were taken from rate tables on agency websites in 2019 and adjusted to common unit amounts for comparison purposes.

**Chart 4-2
Estimated Monthly Water Rates (18 CCF)**

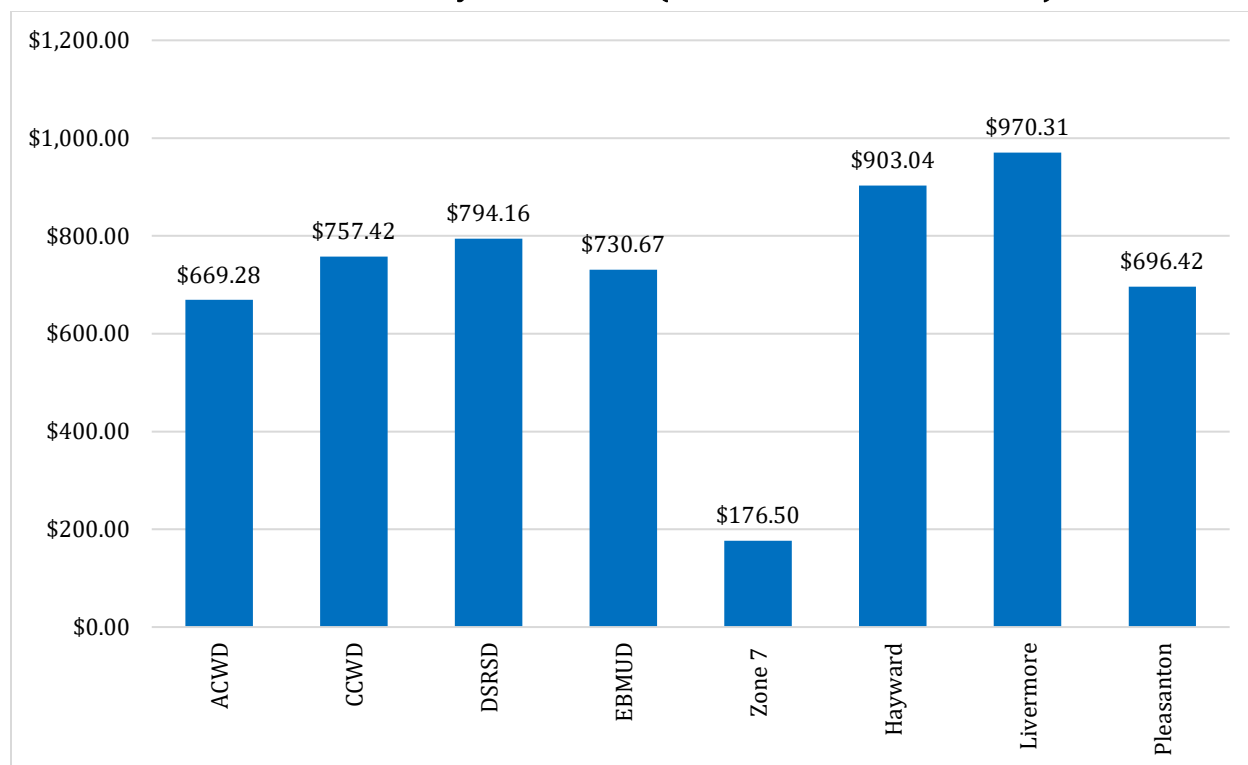


Commercial/Industrial Rates

Commercial and industrial rates vary by the size of the connection provided to the customer. As connection sizes increase, costs increase as more water is able to be delivered, which directly increases other associated costs, such as impacts to the conveyance systems, electricity, and operations and maintenance. Depending on the type of business, the water connection size is directly correlated to the pressure needed for operations.

Chart 4-3 shows the average commercial or industrial rate of the service providers is about \$744.05 based on agency rates for 50 units of water with a four-inch water connection. Most agencies are near or below the average rate within the region, while two agencies, the cities of Hayward and Livermore, are both upwards of \$900 per month. The monthly connection charge for the four-inch service is highest in these two cities, which contributes to most of the difference between other agencies. Hayward also has among the highest cost of water consumption as well.

**Chart 4-3
Estimated Monthly Water Rates (50 units, 4-inch Connection)**



Zone 7 Water Agency is a wholesaler of water and does not have similar maintenance and operations costs as other agencies, which is why the rate is significantly lower as it is just for water to be delivered by other agencies or users.

Special Rates

All the water agencies have other types of service connections than just residential, commercial, and industrial users. These agencies may also provide untreated water, recycled water, and fire service only connections to their customers as well, as shown in Table 4-14.

**Table 4-14
Special Types of Water Service Provided**

Water Agency	Untreated Water	Recycled Water	Fire Service Only
ACWD			
DSRSD		X	
EBMUD	X	X	X
Zone 7	X		
Hayward		X	X
Livermore	X	X	X
Pleasanton		X	
Castlewood CSA			

Depending on the service provider, there are rates that are included in their service charges related to the characteristics of the environment, such as added pumping due to elevation or additional treatment requirements, or of their infrastructure, such as age and frequency of maintenance.

Furthermore, drought conditions all result in different billing structures due to the change in the availability of water. In drought years, depending on the severity, various agencies institute conservation measures in order to promote less overall pumping to preserve their allocation but also charge tiered rates to further discourage usage. In short, drought rates, by the drought stage, were developed to encourage efficient use and maintain sufficient revenues during mandatory conservation efforts (City of Pleasanton, 2015).

Reserve Funds

Reserve funding is established by each agency through the adoption of budgetary policy. So, these amounts vary from agency to agency and may be utilized for different purposes. However, in most cases, the budget reserve has specific criteria as to how much is collected (total dollar amount or percent of revenue, generally) and included in the overall rate structure to be collected. Generally speaking, if any agency had a reserve fund that allowed for operations of between six months to a year, that is adequate and a best management practice in order to allow for the continued operation of the agency even in downturns and unfavorable conditions (see Table 4-15).

Table 4-15
Reserve Balance of Special District Water Agencies FY 18-19²¹

Water Agency	Reserve Balance	Projected Expenditures	Percentage of Expenditures
ACWD	\$120,161,600	\$140,023,600	85.8%
DSRSD	\$12,264,986	29,802,347	41.2%
EBMUD	\$352,600,000	\$772,300,000	45.6%
Zone 7	\$212,651,454	\$199,831,249	106.4%
Castlewood CSA	\$675,000	\$400,000	169%

Some agencies have multiple enterprise funds with multiple reserves for the associated services, such as rate stabilization or capital improvements. For example, the cities which also provide water service have general fund revenues and reserves, which can be used at the discretion of the governing body to allocate services as needed. However, it is not recommended that general fund monies or reserves be used to supplement enterprise funds,

²¹ If a reserve amount was not listed in the Fiscal Year 18-19 budget, beginning fund balance was used to demonstrate available cash on hand for the agency. Agencies providing water and wastewater services have separate reserve funds for each service.

as enterprise funds and the associated rates should be designed to operate independently without aid from outside sources.

4.5.5 - RESTRUCTURING

Prior to 2015, some water agencies adopted alternate rates during times of drought and water rationing. These rates were aimed at promoting more conservation during times of critical availability for water resources and typically increased as usage went up during various drought tiers.

In 2015, a State appeals court ruled that a tiered water rate structure used by the City of San Juan Capistrano to encourage conservation was unconstitutional (*Capistrano Taxpayers Association, Inc. v. City of San Juan Capistrano*). The appellate court held that the tiered rates for the provision of drinking water service, while permissible, must be based on a calculation of the actual cost of providing water service to the members of the given tier. The holding was based on a California constitutional amendment, Proposition 218, which prohibits the imposition of fees for government services that exceed the actual cost of providing service to the property.

The public water agencies discussed in this MSR are following the ruling of the *Capistrano* decision. The rates do not vary based on potential water rationing in times of drought. Future changes to the rate structure must be in compliance with Proposition 218.

4.5.6 - COST AVOIDANCE OPPORTUNITIES

Cost avoidance opportunities are dependent on each agencies' willingness to communicate and share information with other water agencies. Within Alameda County, the agencies do coordinate with partner agencies for commissioning feasibility studies as well as coordinating improvements to already shared infrastructure. Agencies sharing a water source are essentially partners in ensuring conveyance infrastructure is maintained and funded appropriately.

The agencies have been in communication and coordinating to promote better overall source reliability for potable water throughout the region. The following is a list of projects that have been completed between multiple agencies to improve reliability for customers of Alameda County (East Bay Municipal Utility District, 2014):

- \$920M 185 mgd Freeport Intake by EBMUD to deliver water from the Sacramento River to the Bay Area.
- \$20M 30 mgd Hayward Intertie that connects the service area of EBMUD and SFPUC.
- \$120M investment in Semitropic Groundwater Bank in Kern County providing 565 TAF of storage for SCVWD, Zone 7, and ACWD.
- \$3M Intertie in Brentwood that connects CCWD to EBMUD.
- \$11M investment in Cawelo Groundwater Bank in Kern County, providing 120 TAF of additional storage for Zone 7.

- \$35M investment in groundwater demineralization to help manage salt in the Livermore Valley Groundwater Basin and facilitate the use of recycled water in the Zone 7 service area.
- \$19.5M in the DSRSD-EBMUD Recycled Water Authority (DERWA) recycled water treatment facility to expand the capacity from 11.6 to 16.2 mgd.
- \$19M investment in the DSRSD-EBMUD Recycled Water Authority (DERWA) recycled water treatment facility to expand the capacity from 11.6 to 16.2. The investment was from EBMUD, DSRSD, and the City of Pleasanton.
- \$20M investment to make permanent the temporary facility at Lake Del Velle, preventing the potential loss of approximately 11,000 acre-feet of capacity from the Zone 7 system.

There were also coordination efforts proposed on the following potential projects between regional partners:

- ACWD-SFPUC Intertie connecting ACWD's Newark Desalination Facility with SFPUC's Bay Division Pipeline to provide emergency supplies and water transfer opportunities.
- EBMUD-Zone 7 Intertie (\$25M, EBMUD & Zone 7) that would connect EBMUD's water delivery system to Zone 7's, providing potential water sharing and transfer opportunities.
- Pretreatment facility at the Walnut Creek Water Treatment Plant (\$100M, EBMUD) that would allow EBMUD to treat water from the Sacramento River, Los Vaqueros Reservoir, and other sources, enabling EBMUD to deliver supplies to neighboring water agencies.
- West Side SFPUC/SCVWD Intertie that would provide a second connection between SFPUC and SCVWD water delivery systems and enable use of additional local/imported sources for water exchanges and transfers.
- SFPUC-Zone 7 Intertie enabling the exchange of surface water, groundwater, or recycled water supplies.
- Transfer-Bethany pipeline (\$200M, CCWD and regional partners) that would connect the Los Vaqueros Reservoir and CCWD's and EBMUD's intakes to the Bethany Reservoir, enabling the conveyance of water to the South Bay Aqueduct.
- Regional Desalination Plant (\$175M) to supply water to SCVWD, SFPUC, and Zone 7.
- Construction of several new well fields in the Livermore Valley Groundwater Basin to increase total production capacity over a six-year period for Zone 7 while also increase exchange opportunities with other agencies.

The Tri-Valley water agencies completed in 2018 a Tri-Valley Joint Potable Reuse Technical Feasibility Study for a \$220 million regional potable reuse project. The partners were Zone 7, DSRSD, City of Pleasanton, City of Livermore, and California Water Service Company.

It appears that the existing water agencies recognize the need for a regional and collaborative approach to achieving success regarding water conveyance and preservation of supply. Continued communication between agencies is encouraged, and no

recommendations are made at this time regarding additional cost avoidance opportunities as the agencies are being responsible by collaborating on joint facilities and infrastructure to better serve residents.

4.6 - Evaluation of Management Efficiencies

This section provides an evaluation of management efficiencies at the water agencies. This section considers the effectiveness of each agency in providing efficient, quality public services. Efficiently managed agencies are deemed those that consistently implement plans to improve service delivery, reduce waste, eliminate duplications of effort, contain costs, maintain qualified employees, and build and maintain adequate contingency reserves.

Table 4-16 shows the cost per acre-foot of each agency. Costs per acre-foot were calculated by taking the projected 2020 operating costs divided by the projected demand in 2020. The costs range from \$1,140 (Zone 7) to \$1,209 (Hayward), and the median is \$1,610 (ACWD).

**Table 4-16
Operating Costs per Acre-Foot**

Agency	Cost per Acre-Foot
ACWD	\$1,610
DSRSD	\$1,620
EBMUD	\$1,230
Hayward	\$1,209
Livermore	\$1,490
Pleasanton	\$1,850
Zone 7	\$1,140

Source: Agency budgets: Operating Costs

4.6.1 - MANAGEMENT PRACTICES

There are various management practices used by water service providers in Alameda County, which include implementing benchmarking and monitoring performance to improve service delivery, planning efforts, and emergency planning. Water planning among significant water service providers in the County is presented in Table 4-17.

Alameda County Water District

ACWD management practices include benchmarking, financial audits, and performance evaluation. Routine evaluations of the District operations include annual performance plans tailored toward each department’s responsibilities. There are also level-of-service standards where performance is evaluated throughout each department. Annually, goals and objectives are developed by each department and presented to the Board of Directors. The Board reviews a summary of the year’s performance as compared to the set goals and objectives.

Productivity is also monitored and reported to the Board on a monthly basis by the various District departments. The District does not conduct performance-based budgeting.

**Table 4-17
Water Planning**

Service Provider	UWMP Date	Water Master Plan		Capital Improvement Plan		Emergency Response Plan	Other Plans
		Date/Version	Planning Horizon	Date/Version	Planning Horizon		
ACWD	2015	Integrated Resources Planning 1995	30 years	FY 2011–2012	25 years	UWMP Chapter 10	2018 ACWD Strategic Plan
Cal Water	2015	Conservation Master Plan 2016	2016–2020	NP		Emergency Response Plan (ERP)	2018 Infrastructure Improvement Plans for 2019–2021
Castlewood CSA	NA	Castlewood CSA Water and Sewer Assessment (2012)	5 years	FY 2016–2017	2 years	Water and Sewer Assessment	None identified
DSRSD	2016	June 2016	Every 5 years	FY 2018–2027	10 Years	UWMP Chapter 8	Water Master Plan, Long-Term Alternative Water Supply Study
EBMUD	2020	2017	10 years	FY 2022–2023	5 Years	UWMP Chapter 3	Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan
Hayward	2015	2014	20 years	FY 2019–2020	10 Years	UWMP Chapter 8	Recycled Water Facilities Plan, Water Distribution System Master Plan, Water Pollution Control Facility Master Plan
Livermore	2015	2017	20 years	FY 2019–2021	20 years	UWMP Chapter 8	Recycled Water System Asset Management Plan, Recycled Water Master Plan 2011, Water Reclamation Plant Master Plan Update
Pleasanton	2015	2004 Water Distribution System Master Plan Update	10 years	FY 2017–2021	10 years	UWMP Chapter 8	None identified

Service Provider	UWMP Date	Water Master Plan		Capital Improvement Plan		Emergency Response Plan	Other Plans
		Date/Version	Planning Horizon	Date/Version	Planning Horizon		
SFPUC	2015	2018/2019 Water System Improvement Program	2 years	FY 2018–2020	4 years	UWMP Chapter 8	Public Participation Plan
Zone 7	2015	2019 Water Supply Evaluation Update	20 years	FY 2018–2019	10 years	UWMP Chapter 8	Recycled Water System Asset Management Plan, Recycled Water Master Plan 2011, Water Reclamation Plant Master Plan Update, Groundwater Management Plan, Salt Management Plan, Nutrient Management Plan, Alternative Groundwater Sustainability Plan, Final Stream Management Master Plan, Asset Management Plan, Emergency Operations Plan

The District's Integrated Resources Plan (IRP) serves as its strategic long-term water supply planning and Water Master Plan document. The current ACWD adopted IRP covers the period from 2015 through 2020 with an overall planning horizon of 30 years. ACWD conducts capital improvement planning over a 25-year planning horizon, and its most recent plan was adopted in 2020. The District prepared its year 2015 Urban Water Management Plan.

In the event of emergencies, such as earthquakes, ACWD may rely on water sharing through emergency interties with SFPUC, Hayward, and Milpitas. The District has groundwater and reservoir storage for emergency use. Findings from the District's recent analysis of potential water supply losses showed that under the assumptions of the analysis, ACWD would have sufficient supplies to provide full water deliveries to its customers for over 12 months. This would include the projected annual increase in water demand before supply and production constraints limit further deliveries (Alameda County Water District, 2015).

Cal Water

Cal Water completed an Urban Water Management Plan in 2015. The agency has also produced a Conservation Master Plan, which has a four-year planning horizon. For emergency situations, Cal Water has an emergency response plan. The plan requires each district, in this case, the Livermore District, to have a local disaster plan that coordinates emergency responses with other agencies in the area.

To prevent loss of water facilities during an earthquake, auxiliary generators and improvements to the water storage facilities have been installed. During an emergency, the Livermore District can transfer water through an interconnection to or from the neighboring water system owned by the City of Livermore's Water Department. Also, if Zone 7 experiences a period of supply deficiency, Cal Water may extract groundwater from the main basin in excess of the normal contract amount (California Water Service, 2016).

Castlewood CSA

Castlewood CSA management practices include performance evaluation through annual service reviews onsite at the CSA facilities and in the service area with interested property owners and residents. To monitor productivity, monthly and quarterly reports are provided to the Alameda County Public Works Management Agency regarding work plans and performance. Additional management practice conducted by the agency includes performance-based budgeting and annual financial audits. The CSA did not identify benchmarking practices.

The CSA does not have a strategic plan. The CSA's Water Master Plan was last updated in 2012 and has a five-year time horizon. The agency last conducted a Capital Improvement Plan in 2016–2017 with a two-year horizon.

The CSA does not have a formalized emergency response plan. In the event of an emergency, the CSA could access water stored in the SFPUC reservoir located on Country Club grounds or receive supplemental water from the City of Pleasanton through an intertie.

City of Hayward

The City's management practices include department evaluations which are integrated into the City's budget process. Each department has performance objectives and goals adopted in the annual budget. The City does not conduct performance-based budgeting or benchmarking.

The City's Water Master Plan was last updated in 2014 and has a 20-year time horizon. The City's Urban Water Management Plan was last updated in 2015. The City's Capital Improvement Plan was last updated in 2019 and has a 10-year time horizon.

To prepare for a seismic event or other emergencies, the City has established agreements with EBMUD and ACWD to exchange emergency water supplies. The City also has a number of locations where adjacent fire hydrants have been constructed, which can be connected with portable hoses to provide water for firefighting or during emergencies (City of Hayward, 2016). The City has a Water Distribution System Master Plan, which describes what will happen in emergencies, and Chapter 8 of the Urban Water Management Plan describes the City's emergency response plan in more detail.

City of Livermore

The City's management practices include workload monitoring by department heads. Individual departments establish internal annual goals and assign goals to individual employees. The City does not conduct performance-based budgeting or benchmarking.

The City's Water Master Plan was updated in 2017 and has a planning horizon of 20 years. Livermore conducts capital improvement planning over a 10-year planning horizon; its more recent plan was prepared in FY 2019-2021. The City prepared an Urban Water Management Plan in 2015.

The City has participated in the development of a valley-wide plan for potable water distribution during emergencies. The Tri-Valley providers have identified water-critical customers and possible potable water distribution sites. In the event of emergencies, such as earthquakes, Zone 7, the City's wholesale provider, will rely on groundwater reserves and Lake Del Valle water. In case of total disconnection of water supply from Zone 7, the City could obtain water from California Water Service groundwater wells (City of Livermore, 2016). Chapter 8 of the City's Urban Water Management Plan describes the City's emergency response plan.

City of Pleasanton

City of Pleasanton management practices include workload monitoring and annual Council adoption of service and policy priorities. The City does not conduct performance-based budgeting or benchmarking.

Pleasanton's Urban Water Management Plan was last updated in 2021. Their Water Distribution System Master Plan was last updated in 2004; there is a planned Update beginning in 2021. Pleasanton conducts capital improvement planning over a five-year planning horizon; its most recent plan was prepared for FY 2017-2021.

The City has participated in the development of a valley-wide plan for potable water distribution during emergencies. The Tri-Valley providers have identified water-critical customers and possible potable water distribution sites. In the event of emergencies such as earthquakes, Zone 7, the City's wholesale provider, will rely on ground water reserves and Lake Del Valle water to make deliveries to its retailers. In case of total disconnection of water supply from Zone 7, the City would rely on groundwater (City of Pleasanton, 2015). Chapter 8 of the City's Urban Water Management Plan describes the City's emergency response plan.

Dublin San Ramon Services District

The District's Water Master Plan was last updated in 2016 and has a five-year planning horizon. DSRSD conducts capital improvement planning over a 10-year planning horizon; its most recent plan was prepared in 2018. The District prepared its 2015 Urban Water Management Plan in 2016.

In the event of emergencies that would make water from both SWP and Zone 7 unavailable, the District has a water shortage contingency plan. If no water were available from the SWP, Zone 7 would need to meet customer demand with groundwater and available local water stored in Lake Del Valle. If both of the major pipelines from Zone 7 were out of service, DSRSD would need to receive its water from its emergency interties with EBMUD and the City of Pleasanton (Dublin San Ramon Services District, 2016). The District has conducted a Long-Term Alternative Water Supply Study, and Chapter 8 of its Urban Water Management Plan describes its emergency response plan.

East Bay Municipal Utility District

EBMUD management practices include benchmarking, annual personnel performance evaluations, annual financial audits, and financial trend and budget performance reports. The District's service operations are also routinely evaluated. The District has developed performance indicators to monitor workload for specific areas as well as district-wide planning and goal setting. The performance indicators track productivity and error rates for the various types of work performed.

EBMUD's Water Master Plan was updated in 2020, and has a planning horizon of 10 years. EBMUD has also implemented a Mokelumne/Amador/Calaveras Integrated Regional Water

Management Plan. EBMUD conducts capital improvement planning over a five-year planning horizon; its most recent plan was prepared in FY 2022-2023. The District prepared its year 2020 Urban Water Management Plan (East Bay Municipal Utility District, 2020).

In the event of emergencies, such as earthquakes, EBMUD has an emergency operations plan which describes the internal organization structure used in response to all emergencies, including regional power outages and earthquakes. The plan was last revised in 2020. EBMUD complies with the California Standardized Emergency Management System (SEMS), which includes all National Incident Management System (NIMS) guidance for federal emergency operations plans.

As one of the eight major water suppliers in the San Francisco Bay Area, EBMUD and other agencies recognize that in the event of a regional catastrophe, assistance from other local agencies is not guaranteed. To mitigate the risk of limited access to local mutual aid, EBMUD entered into a Multiagency Mutual Assistance Agreement with Los Angeles Department of Water and Power and with Las Vegas Valley Water District to mutually supply as much of the requested resources as possible to the other agency, if a regional disaster impacts only one of the agencies (East Bay Municipal Utility District, 2020). Chapter 3 of the District's Urban Water Management Plan explains its emergency response plan in more detail.

SFPUC

The San Francisco Public Utilities Commission completed an Urban Water Management Plan in 2015. The agency has also produced a Water System Improvement Program, which has a two-year planning horizon. For emergency situations, SFPUC discusses their plan in Chapter 8 of their Urban Water Management Plan. In the event of a catastrophe, they will turn to their Emergency Response and Recovery Plan, Water Quality Notifications and Communications Plan, and their City Emergency Drinking Water Alternatives Report.

In the event of an emergency, the agency has constructed system interties to the EBMUD-Hayward-SFPUC Intertie, the SCVWD Intertie, and the South Bay Aqueduct Intertie (San Francisco Public Utilities Commission, 2016).

Zone 7 Water Agency

Zone 7 management practices include performance and program audits conducted by outside consultants. Zone 7 tracks workload through individual personnel performance evaluation and task planning and monitoring for its Engineering, Water Resources, and Maintenance Departments. Additional management practices conducted by Zone 7 include performance-based budgeting and annual financial audits.

Zone 7's water supply evaluation update was last updated in 2019 and has a planning horizon of 20 years. Zone 7 conducts capital improvement planning over a 10-year planning horizon; its most recent plan was prepared in FY 2018-2019. The District prepared its year 2015 Urban Water Management Plan.

In the event of emergencies, such as earthquakes, Zone 7 has prepared an emergency operations plan and also has an Emergency Operations Center. Even if there were a complete interruption of deliveries from the South Bay Aqueduct, Zone 7 would still be able to meet its current water demands with existing facilities during non-summer months using groundwater stored in the groundwater basin and surface water stored in Lake Del Valle. Deliveries to retailers would be reduced as necessary during the summer months (Zone 7 Water Agency, 2016). Chapter 8 of the District's Urban Water Management Plan explains its emergency response plan in more detail.

4.7 - Policy Analysis

This section provides policy analysis that is focused on the agencies under LAFCO's purview. The policy analysis includes assessment of local accountability and governance, evaluation of management efficiencies, as well as identifying government structure options that may be considered by LAFCO.

All the water service agencies practice proper dissemination of information by putting their budgets, agenda, and other general business documents on their websites. Castlewood CSA has limited information available directly under a page for itself, but pertinent information can be found in the Alameda County overall budget documentation pertaining to the agency. All agencies also make video broadcasts available either through web access or through local public television. Archives of past meetings are also available, which allow for accountability of past actions and clarification of issues discussed on the record for both constituents as well as the officials to review.

County voter turnout rate has been approximately 75 percent during the past three presidential elections and ranged from 22 to 66 percent for the past three non-presidential elections (Alameda County Elections Department, 2020). Most of the agencies maintain within those ranges and promote voting during their election cycles for officers when warranted (see Table 4-18).

4.8 - Determinations

- There are four special districts engaged exclusively in water services in Alameda County. They are the Alameda County Water District (ACWD), Dublin San Ramon Services District (DSRSD), East Bay Municipal Utility District (EBMUD), and the Zone 7 Water Agency.
- There are four multipurpose agencies that provide water services in Alameda County: Castlewood County Service Area and the cities of Hayward, Pleasanton, and Livermore.
- For emergency sharing of potable water, several of the agencies have interties, including EBMUD with DSRSD, Costa Contra Water District, and City of Hayward; ACWD and cities of Milpitas and Hayward; DSRSD with cities of Pleasanton and Livermore; and City of Livermore with California Water Service Company.

**Table 4-18
Public Accountability**

	ACWD	DSRSD	EBMUD	Zone 7	Hayward	Livermore	Pleasanton	Castlewood CSA
Direct Service Provider	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Voter turnout	69.2%	n/a	49.7%	76.8%	63.4%	84.6%	78.1%	n/a
Broadcast Meetings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Public comment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Discloses Finances	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Discloses Rates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Posts documents to website	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

- The City of Livermore, City of Pleasanton, and DERWA, a joint powers authority between DSRSD and EBMUD, provide recycled water.
- Urban water demand is primarily affected by population and economic growth and by water use efficiency. Population and economic growth lead to greater water use.
- Of the major water providers, EBMUD is the only agency that will need to develop supplemental supplies to meet project customer demands in a future multi-year drought. EBMUD can meet customer demands out to 2040 during normal years and single dry years. Its strategy is to pursue a variety of supplemental supply projects simultaneously to minimize the risks associated with any one project and to ensure delivery of emergency water supplies during dry years.
- In the past, some jurisdictions would increase water rates as a technique to promote conservation, under the assumption that water use levels change in response to changes in water prices, improvements in the efficiency of plumbing fixtures, and conservation programs. However, as the result of a 2015 court case, water agencies can no longer have tiered water rates to encourage water conservation, and agencies can only set rates based on the cost to provide the service.
- Most of the potable water in Alameda County is imported surface water. The primary sources of potable water in Alameda County are through the Mokelumne River and the State Water Project.
- As a result of the restrictions in the Delta, the concerns with water quality, and the variability of imported water supplies due to climate change, the agencies in the Bay Area and in Alameda County are exploring more diversified water supply portfolios and looking to regional and local supplies, such as recycled water and desalination.
- Retail water providers store smaller quantities of potable water as reserves. On average, the water retailers, ACWD, Cal Water, DSRSD, and the cities of Hayward, Livermore, and Pleasanton have enough storage capacity to accommodate the average daily water demand for at least 1.5 days. DSRSD is able to accommodate the average daily demand for the least amount of time, 1.5 days, as the agency's storage capacity is 42.3 million gallons per day, and the average daily demand is 27.5 million gallons per day.
- Municipal water providers practice extensive facility sharing and regional collaboration. The water systems throughout the region are interconnected. Providers receiving water supplies from a common source share storage and conveyance facilities. Emergency interties connect neighboring providers with backup supplies. Multiagency cooperation is common practice for planning efforts, emergency preparedness, and recycled water provision.
- The Bay Area's five largest water agencies, the Contra Costa Water District, EBMUD, SFPUC, the Santa Clara Valley Water District, and Zone 7, are jointly exploring a

regional desalination project that would provide an additional water source, diversify the area's water supply, and foster long-term regional sustainability. The main goal is to locate a 10 to 20 million gallons per day desalination treatment facility in eastern Contra Costa County to turn brackish water into a reliable, drought-tolerant drinking water supply. EBMUD's current role in the regional desalination plan is limited to potentiality wheeling water for the Bay Area agencies that are evaluating the project.

- Every major water provider has a drought preparedness plan and storage options were a drought to occur. With the recent severe drought from 2011 to 2019 (mostly from 2014 to 2017), water agencies were forced to enact their drought preparedness programs.
- Water service charges, connection fees, property tax, assessments, and voter-approved measures are significant revenue sources for water enterprises in Alameda County. There is a basic difference in how single service and multiservice agencies collect funds for water enterprises. Multiservice agencies are able to split overhead costs within their rates of multiple municipal services in order to provide lower overall costs for water services, whereas single service agencies must include all overhead within the rate for water service.

SECTION 5 - WASTEWATER SERVICES

5.1 - Service Overview

5.1.1 - SERVICE PROVIDERS

This section provides a brief profile of each wastewater service provider. Table 5-1 lists the providers and specific services each provide. Table 5-2 and Figure 5-1 shows their location.

**Table 5-1
Limited Purpose Special Districts**

Service Providers	Wastewater Collection	Wastewater Treatment	Wastewater Disposal
Castro Valley Sanitary District (CVSD)	●		
Dublin San Ramon Services District (DSRSD)	●	●	
East Bay Municipal Utility District (EBMUD)		●	●
Oro Loma Sanitary District (OLSD)	●	●	
Union Sanitary District (USD)	●	●	
Castlewood County Service Area (CSA)	●		
City of Alameda	●		
City of Albany	●		
City of Berkeley	●		
City of Emeryville	●		
City of Hayward	●	●	
City of Livermore	●	●	
City of Oakland	●		
City of Piedmont	●		
City of Pleasanton	●		
City of San Leandro	●	●	
East Bay Dischargers Authority (EBDA)		●	●
Livermore-Amador Valley Water Management Agency (LAVWMA)			●

Wastewater collection service is available in most of the developed areas of the County through the municipal wastewater systems of the providers listed above (see Figure 5-1). Areas that do not have a municipal wastewater system, but may have wastewater services through a district, include Sunol, Hayward Marsh areas, Union City, ridge areas between and within Pleasanton and Hayward, canyons north of Castro Valley, and sparsely developed areas in eastern Alameda County.

In some cases, the agencies provide wastewater services outside their boundaries. Agencies are required to seek LAFCO approval before extending service to territory outside their boundaries.

Table 5-2
Sewer Service Providers by Location

Geographic Location	Wastewater Collection	Wastewater Treatment	Wastewater Disposal
Cities			
Alameda	City	EBMUD	EBMUD
Albany	City	EBMUD	EBMUD
Berkeley	City	EBMUD	EBMUD
Dublin	DSRSD	DSRSD	LAVWMA and EBDA
Emeryville	City	EBMUD	EBMUD
Fremont	USD	USD	EBDA
Hayward	City ²²	City ²²	EBDA
Livermore	City	City	LAVWMA and EBDA
Newark	USD	USD	EBDA
Oakland	City	EBMUD	EBMUD
Piedmont	City	EBMUD	EBMUD
Pleasanton	City	DSRSD ²³	LAVWMA and EBDA
San Leandro	City ²²	City ²²	EBDA
Union City	USD	USD	EBDA
Unincorporated Census Designated Places			
Ashland	OLSD	OLSD	EBDA
Castro Valley	CVSD and OLSD	CVSD and OLSD ²⁴	OLSD and EBDA
Cherryland	OLSD	OLSD	EBDA
Fairview	OLSD	OLSD	EBDA
San Lorenzo	OLSD	OLSD	EBDA
Sunol	individual	individual	individual
Unincorporated Communities with CSAs			
Castlewood	Castlewood CSA	DSRSD ²⁵	LAVWMA and EBDA
Five Canyons	OLSD	OLSD	

Source: EBMUD Urban Water Management Plan 2015, City of Albany Public Works Department, Berkeley Sewer Water Master Plan, DSRSD Sanitary Sewer Management Plan 2012, Emeryville Sanitary System Master Plan 2014, Hayward Sewer Master Plan 2015, Oakland Public Works Department, Piedmont Sewer System Master Plan 2014, San Leandro Sewer System Master Plan 2017, CSVD Sewer System Management Plan, DSRSD Urban Water Management Plan, and OLSD Sewer System Management Plan

The following agencies have provided wastewater service directly or indirectly outside their boundaries: City of Berkeley, Castlewood CSA, Castro Valley Sanitation District, Dublin San Ramon Sanitation District, City of Hayward, City of Livermore, City of Pleasanton, Oro Loma Sanitary District, and Union Sanitary District.

²² Oro Loma Sanitary District (OLSD) provides wastewater collection and treatment to a portion of San Leandro and a small portion of Hayward

²³ The City of Livermore provides wastewater treatment to a small portion of Pleasanton.

²⁴ Castro Valley Sanitary District (CVSD) owns 25% of the Oro Loma Sanitary District/Castro Valley Sanitary District Water Pollution Control Plant, which is operated by OLSD.

²⁵ Castlewood County Service Area contracts for wastewater treatment with the City of Pleasanton, who in turn contracts with Dublin San Ramon Service District.

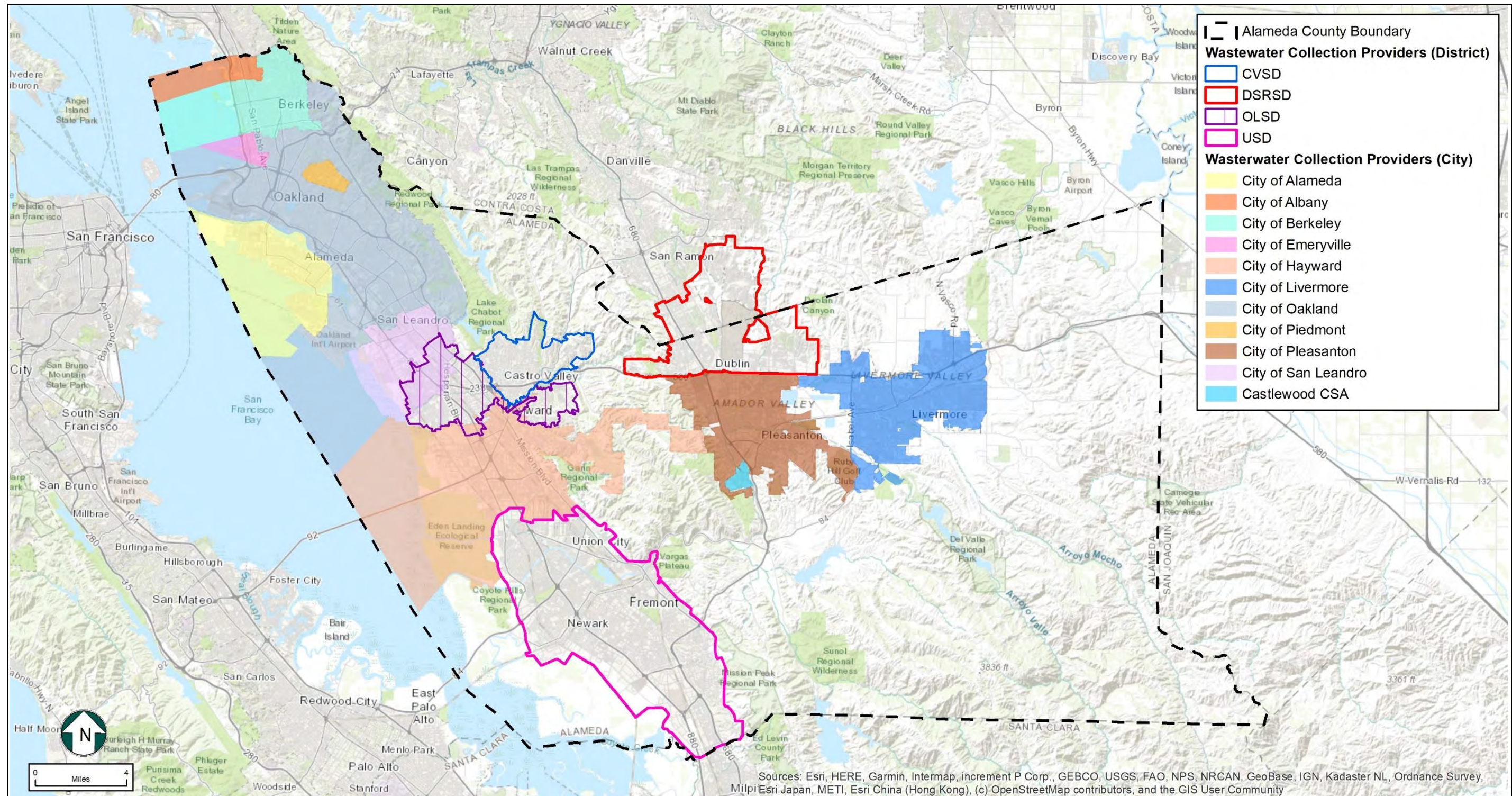


Figure 5-1
Wastewater Collection Service Providers



5.1.2 - LIMITED SERVICE AGENCIES/SERVICE AREA

Five special districts provide services exclusive to utility services. Those services providers are Castro Valley Sanitary District, Dublin San Ramon Services District, East Bay Municipal Utility District, Oro Loma Sanitary District, and Union Sanitary District.

The Castro Valley Sanitary District (CVSD) provides wastewater collection services. The system is approximately 160 miles of sewers and nine wastewater pumping plants, together with five miles of outfall sewer lying outside CVSD boundaries (Castro Valley Sanitary District, 2018). Wastewater from CVSD is treated under contract by Oro Loma Sanitary District at the Oro Loma/Castro Valley Water Pollution Control Plant in San Lorenzo, of which Castro Valley Sanitary District owns 25 percent. The East Bay Discharges Authority (EBDA) provides wastewater disposal services for the District. Its wastewater service area includes the unincorporated community of Castro Valley. CVSD is an independent political subdivision of the State of California and is a public corporation. CVSD operates under the authority of the Sanitary District Act of 1923 to provide sewer services to the growing Castro Valley residential community.

The Dublin San Ramon Services District (DSRSD) wastewater collection system includes approximately 187 miles of sanitary sewers ranging from six to 42 inches in diameter that are from five to over 40 years old. Wastewater collected travels by gravity and lift stations to the DSRSD Wastewater Treatment Plant located in the City of Pleasanton (Dublin San Ramon Services District, 2012). In addition, DSRSD owns and operates a recycled water treatment facility (RWTF) at its Wastewater Treatment Plant and participates with East Bay Municipal Utility District in a joint power authority DSRSD-EBMUD Recycled Water Authority (DERWA), which operates the San Ramon Valley Recycled Water Program (SRVRWP) (Dublin San Ramon Services District, 2017). DSRSD's water services are discussed in Section 4. Disposal of treated effluent from the Wastewater Treatment Plant is the responsibility of LAVWMA, which exports secondary treated wastewater to the East Bay Dischargers Authority interceptor pipeline for discharge to the San Francisco Bay via a deep-water outfall. LAVWMA's wastewater service area includes the City of Dublin, City of Pleasanton, and the southern portion of San Ramon (which is outside the jurisdiction of Alameda County).

The East Bay Municipal Utility District (EBMUD) provides wastewater treatment service and disposal services and distributes recycled water. The District's water services are discussed in Section 4. EBMUD's Wastewater Service District (known as Special District No. 1, or SD-1) was established as a separate wastewater district within EBMUD's water service area in 1944. SD-1 serves approximately an 88-square-mile area of Alameda and Contra Costa counties along the east shore of the San Francisco Bay, extending from Richmond in the north to San Leandro in the south (East Bay Municipal Utility District, 2016). SD-1 treats domestic, commercial, and industrial wastewater for the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont, and others outside Alameda County. Each of these communities operates sewer collection systems that discharge into one of five EBMUD sewer interceptors (Adeline, Alameda, North, South, and South Foothill).

The Oro Loma Sanitary District was formed on August 7, 1911, and is one of the oldest sanitary agencies in Alameda County. Oro Loma provides wastewater collection and treatment services. Its service area encompasses 13 square miles, serving the communities of unincorporated Alameda County, including San Lorenzo, Ashland, Cherryland, Fairview, portions of Castro Valley, and designated areas of the cities of Hayward and San Leandro. Currently, there are approximately 273 miles of sewer lines, 12 remote lift stations, 32,000 building service connections, and 6,022 manholes located in the District and maintained by it. As of July 2021, the average age of the collection system is 51 years old. OLSA has had an active Sewer Management Program since 1988 and maintains a high-performing collection system, regularly achieving less than one sewer overflow per 100 miles of collection system per year. Oro Loma provides advanced treatment of the wastewater from its service area and Castro Valley Sanitary District.

The Union Sanitary District (USD) is comprised of three major drainage basins: Alvarado Basin, Newark Basin, and Irvington Basin. The Irvington Basin is the largest and southernmost basin of the District's service area (Union Sanitary District, 2015). The Newark Basin is in the center of the District's service area, with the Alvarado Basin to the north and the Irvington Basin to the south (Union Sanitary District, 2012). The Alvarado Basin is the northernmost part of the District's service area (Union Sanitary District, 2017). Flows are then conveyed to the Alvarado Pump Station, which is located at the USD Wastewater Treatment Plant, then later transferred to EBDA for discharge. The District is permitted to direct flows above 42.9 MGD from the WWTP to the Old Alameda Creek to provide hydraulic relief to the wastewater system. The District formerly directed excess flows to the Hayward March which is owned and operated by the East Bay Regional Park District (the Park District). The Park District is planning to convert the Hayward Marsh to a tidally influenced salt marsh, making it no longer suitable for wet weather discharge of treated effluent. Its wastewater service area includes the developed areas of the cities of Fremont, Newark, and Union City. The District was formed in 1918 as an independent special district and reorganized under the Sanitary District Act of 1923 to provide services to areas that are now the cities of Newark and Fremont. USD has developed the Enhanced Treatment and Site Upgrade (ETSU) program to serve as a roadmap for the treatment plant's infrastructure over the next 40 years (Union Sanitary District, 2019).

5.1.3 - MULTIPURPOSE AGENCIES/SERVICE AREA

There are 15 multipurpose agencies engaged in wastewater services in Alameda County. Three agencies provide wastewater collection and a portion of treatment services, while the other 12 agencies have contracted with a limited purpose agency to receive collection and/or treatment services.

The cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont operate wastewater collection systems and rely on EBMUD for wastewater treatment and disposal. All of these cities' service areas are coterminous with their bounds, except Berkeley serves areas outside its bounds, as discussed below (East Bay Municipal Utility District, 2016).

The City of Emeryville mainly relies on its own wastewater collection system; however, many of the early sewers were installed by private developers and were not subject to uniform standards and inspection. From the collection system, it is then treated and disposed of by EBMUD (City of Emeryville, 2014).

The City of Dublin relies on DSRSD for wastewater collection services, treatment, and disposal systems (Dublin San Ramon Services District, 2012).

The City of Hayward provides wastewater treatment and collection services. The City is served by a wastewater collection system consisting of approximately 337 miles of sewer pipelines and nine sewage pump stations. EBDA provides the disposal of wastewater in Hayward (City of Hayward, 2016). Hayward's wastewater service area is all the territory within the City of Hayward's city limits except for a few small areas on the north, which are part of the Oro Loma Sanitary District service area.

The City of Livermore provides wastewater treatment and collection services. Livermore has approximately 286 miles of sanitary sewer lines ranging in size from six inches to 48 inches. Wastewater collected from Livermore, Lawrence Livermore National Laboratory, and the City of Pleasanton's Ruby Hills housing development is collected and treated at the City of Livermore Water Reclamation Plant. LAVWMA and EBDA provide the disposal of wastewater in Livermore (City of Livermore, 2019). Livermore's wastewater service area includes all of Livermore except in the agricultural areas.

The City of San Leandro provides wastewater treatment and collection services. San Leandro operates the Water Pollution Control Plant, which has approximately 130 miles of sanitary sewer pipelines, 13 remote sewage pump stations, and the inspection and maintenance of San Leandro's stormwater collection system. EBDA provides the disposal of wastewater in the City (City of San Leandro, 2017). The City's wastewater service area includes northern and central portions of the City, approximately two-thirds of the City's territory.

The City of Pleasanton provides wastewater collection and billing but contracts with DSRSD for wastewater treatment. LAVWMA and EBDA provide wastewater disposal in the City (City of Pleasanton, 2014). Pleasanton's wastewater service area includes all the territory in the City except a small area in a southern portion where the Castlewood CSA provides collection services.

Union City, Fremont, and Newark rely on the Union Sanitary District for collection, transport, treatment, and disposal systems (Union Sanitary District, 2018).

Castlewood CSA consists of 587 acres in the unincorporated areas of Alameda County. The CSA encompasses 220 single-family residences and the Castlewood Country Club building and facilities. The CSA's sewer system consists of 28,000 feet of six- to eight-inch pipelines with 125 manholes and 18 cleanouts or risers (Alameda County Public Works Agency, 2012). Sewer flow from Castlewood CSA is treated at the Dublin San Ramon Service District Treatment Plant after flowing through the City of Pleasanton collection system (Dublin San

Ramon Services District, 2012). LAVWMA and EBDA provide wastewater disposal in the CSA via the DSRSD Treatment Plant. The CSA's wastewater service area includes an unincorporated area adjacent to the City of Pleasanton's southern boundary.

5.1.4 - OTHER PROVIDERS

EBDA was formed in 1974 as a joint powers authority. The five member agencies are the cities of San Leandro and Hayward, Union Sanitary District, and Oro Loma and Castro Valley Sanitary Districts. Each member agency is allowed to discharge to the EBDA system an amount of wastewater based on its capacity allocation (EBDA.org, 2019). The combined effluent flows approximately seven miles through the outfall pipeline into San Francisco Bay.

LAVWMA is a JPA comprised of the cities of Livermore and Pleasanton along with DSRSD. LAVWMA was created in 1974 to transport treated wastewater from Livermore, Pleasanton, and DSRSD to San Francisco Bay. Key infrastructure includes the 15.6 miles of 24- to 36-inch export pipeline to the EBDA system in San Lorenzo, a wet weather outfall, and an emergency wet weather outfall (LAVWMA.com, 2019). The export pipelines pass through Pleasanton, over the Dublin Grade, through Castro Valley, San Lorenzo, and San Leandro. At the San Leandro Marsh, the LAVWMA export pipeline empties into an outfall owned by the East Bay Dischargers Authority (EBDA).

LAVWMA also has an emergency dichlorination facility and bypass pipeline to discharge into the San Lorenzo Creek in case of an interruption in EBDA's service.

5.1.5 - UNINCORPORATED

Remen Tract is a neighborhood in an unincorporated County island completely surrounded by Pleasanton. The tract receives stormwater and flood control services from Zone 7 Water Agency. As a condition of approval for development, the County oftentimes requires that the property owners obtain water and sewer service from the City of Pleasanton. There are 48 parcels in the Remen Tract, of which 38 have existing water and/or sewer connections, some of which were connected prior to January 1, 2001, meaning that the City was not required to secure LAFCO approval for the connections. The City of Pleasanton has determined that 24 properties have pre-annexation agreements. LAFCO has agreed to give retroactive approval of sewer services to 19 properties that were connected to City infrastructure after January 1, 2001, and thus require LAFCO approval. The approval was for out-of-area service agreements, which are used to provide municipal services to areas that have not been annexed to cities. This retroactive approval applied to properties that had connections to City infrastructure but had not previously received LAFCO approval.

Happy Valley is an approximately 318-acre unincorporated community near the southern city limits of Pleasanton. The majority of Happy Valley is within the City; however, the OASA is for the remaining parcels outside the city limits. In September 2016, LAFCO approved an out-of-area service agreement for sewer services to a property in Happy

Valley and Sunol with the condition that Pleasanton works with the County to study providing sewer services to the entire Happy Valley area.

Sunol is an unincorporated census designated place (CDP) in central Alameda County. The approximate population is 967, according to the 2017 Census (US Census Bureau, 2017). Currently, residents within Sunol do not have an option to connect to a municipal wastewater system. Alameda County regulates and monitors all onsite wastewater treatment systems (OWTS), also known as septic systems, for that area, according to State law. Sunol can be considered an area of concern or focus area because it has a high density of OWTS and may consider developing a community wastewater management system. A conventional gravity sewer system is currently proposed for Sunol, Lower Kilkare Road, and Kilkare Woods area. The sewer system will serve those areas and connect to the DSRSD for sewage treatment and disposal (Alameda County Department of Environmental Health, 2016).

Mendenhall Springs is an unincorporated community in eastern Alameda County, southeast of the City of Livermore. It is not a census designated place.

Kilkare Woods is a rural unincorporated community designated place in central Alameda County near the City of Pleasanton and within the Sunol CDP. It is not a census designated place.

5.1.6 - SEPTIC TANK USAGE

The Alameda County Department of Environmental Health is responsible for regulating onsite wastewater treatment systems (OWTS) throughout the unincorporated areas of the County. The department also administers OWTS regulations in the various cities in the County, as discussed further below. OWTS are used largely for properties located outside of municipal sewer service boundaries, although there are still many isolated properties within the incorporated areas that have not been connected to sewers and continue to use OWTS. More than half of the properties served by OWTS are in the eastern portions of the County within the Upper Alameda Creek watershed. The largest concentrations are in the unincorporated community of Sunol and on the fringes of Pleasanton, Livermore, and Castro Valley (Alameda County Department of Environmental Health, 2016).

The Alameda County OWTS regulations and amendments (effective January 15, 2009) were developed under the authority of the Alameda County General Ordinance Code, Chapter 15.18.040.B. The regulations provide for the safe and sanitary treatment and disposal of private sewage. The County regulations provide minimum standards for the construction and operation of OWTS to safely treat and dispose of sewage in order to prevent environmental degradation, including pollution of surface water and groundwater, and to protect public health, safety, and welfare to the greatest extent possible. The County regulations are not intended to replace requirements of the State Water Resources Control Board or other local agencies, such as the Zone 7 Water Agency, which must also be met (Alameda County Department of Environmental Health, 2016).

The Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (State OWTS Policy) was adopted by the SWRCB on June 19, 2012, and became effective on May 13, 2013. The policy recognizes that local agencies can provide the most effective means to manage OWTS on a routine basis. Therefore, as an important element, it is the intent of the policy to utilize and improve upon necessary existing local programs through coordination with State and local agencies.

Alameda County Department of Environmental Health, Onsite Wastewater Treatment System Program coordinates with the San Francisco Regional Water Quality Control Board (RWQCB) to permit OWTS sewage disposal and to ensure safe, potable water on new and existing development projects in all areas of Alameda County (Department of Environmental Health of Alameda County, 2019).

Septic systems are allowed in most areas of the County only if there is no nearby public sewer system. In most cases, a public sewer shall be permitted to be considered as not being available if the public sewer or a building connection is more than 200 feet from a proposed building or exterior drainage facility on a lot or premises (International Association of Plumbing and Mechanical Officials, 2016), in accordance with Section 713.4 of the Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials.

Most OWTS are located in the eastern portion of Alameda County. Cities with large amounts of land and open space typically have more registered septic systems. An inventory from the Alameda County of Environmental Health depicts an approximate total of 2,886 parcels with a septic system within city and County jurisdictions. Relatively little septic usage was identified in the cities and in the unincorporated but developed areas of Ashland, Cherryland, and San Lorenzo.

5.1.7 - SAN FRANCISCO BAY ENVIRONMENTAL ISSUES

Nationally, nutrient pollution, caused by excess nitrogen and phosphorus in the air and water, is one of America's most widespread, costly, and challenging environmental problems. Too much nitrogen and phosphorus in the environment can impact surface waters. Nutrients can cause algae to grow faster than ecosystems can handle, leading to adverse impacts to water quality, food resources, and habitats and to decreases in oxygen that fish and aquatic life need to survive.

The San Francisco Bay has not experienced nitrogen-nutrient-related environmental problems, despite being considered nutrient-rich, as it has been considered resilient to the effects of nutrients. The primary reason is that, in the estuary, the abundance of phytoplankton, microalgae that form an essential component of the aquatic food chain, has historically been lower than would be expected in a nutrient-enriched system due to a number of factors, including strong tidal mixing in the Bay; high Bay turbidity, which limits light penetration; and high filtration by clams. Recently, there have been changes observed indicating that the Bay's resilient environment to the effects of nutrients may be declining.

Collaborative efforts with multiple agencies will be necessary in order to combat this decline.

In 2014, all municipal wastewater treatment facilities that discharge into the San Francisco Bay were required to obtain a new watershed permit. The regulatory update in the form of a reissue of the nutrient watershed permit provides a consistent approach for regulating nutrient discharges from municipal wastewater treatment plants in the Bay watershed. This permit covers more than 30 permittees that represent about two-thirds of the nutrient load to the Bay. The permit also contains requirements for technical studies to be conducted that will inform future board consideration of the level of nutrient reduction that may be necessary to avoid Bay impairment and to increase the certainty that those reductions, if required at wastewater treatment plants, will produce the desired outcome (California Water Boards San Francisco Bay - R2, 2017).

Nutrients in the San Francisco Bay are a growing concern for the Bay Area water quality community. Historically, San Francisco has not been adversely impacted by nutrient loading, although there are indications that its historic resilience to the effects of nutrient enrichment may be weakening. While the definition of impairment has not been reached, there is concern that San Francisco Bay has reached a tipping point that might lead to impairment. Numerous scientific studies are being conducted to understand the impact of nutrients on San Francisco Bay. As a result, it may be necessary to limit the availability of essential nutrients by implementing some form of nutrient removal to address potential challenges.

In 2014, a Consent Decree was reached between the EPA, the California State Water Resources Control Board, SF Baykeeper, Our Children's Earth Foundation, the East Bay Municipal Utility District, the Stege Sanitary District, and the Cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont. The Decree requires the respondents to continue updating sewer infrastructure to help protect San Francisco Bay.

On April 9, 2014, the Water Board issued Order No. R2-2014-0014, Waste Discharge Requirements for Nutrients from Municipal Wastewater Discharges to San Francisco Bay (first Watershed Permit). On May 8, 2019, the Water Board issued Order No. R2-2019-0017, Waste Discharge Requirements for Nutrients from Municipal Wastewater Discharges to San Francisco Bay (second Watershed Permit). The Watershed Permit approach sets forth a regional framework to facilitate collaboration on studies that will inform future management decisions and regulatory strategies. The permit expands upon the first Watershed Permit that focused on treatment opportunities within each plant. The 2019 permit includes two key elements for evaluating nutrient load reduction opportunities for agencies (if supported by sound science): water recycling and natural systems.

In response to the Watershed Permit, the POTWs are working collectively under the joint powers agency, Bay Area Clean Water Agencies (BACWA), to submit one coordinated study. On February 3, 2021, BACWA released its most recent Key Regulatory Issue Summary. Topics of the regulatory issues include Nutrients in the San Francisco Bay, the

Nutrient Watershed Permit, Chlorine Residual Compliance, Pesticides, State Water Board Toxicity Provisions, and PFAs. The Issue Summary discusses the regulatory background, challenges, and receipt updates to the regulations and action items for the agencies of BACWA. BACWA periodically updates the Issue Summary in order to stay up to date with the regulations and associated requirements.

5.2 - Service Demand

5.2.1 - DEMAND DRIVERS

Wastewater demand is primarily affected by population and economic growth, water use efficiency, infiltration and inflow, and loading factors. Many of the water demand drivers discussed in Section 4 are also wastewater demand drivers during dry periods. Water used for outdoor purposes, such as landscape, irrigation, firefighting, street cleaning, and residential car washing, does not flow into the wastewater system.

Many innovations have been made to reduce the rapid increase in wastewater demand. Water-efficient plumbing fixtures reduce the amount of wastewater. Low-flow toilets and washing machines can significantly reduce the demand for expanded wastewater services.

Wastewater flow dischargers include residences, businesses, institutions, and industrial establishments but also infiltration and inflow. Infiltration refers to groundwater that seeps into sewer pipes through cracks, pipe joints, and other system leaks. Inflow refers to rainwater that enters the sewer system from sources such as yard and patio drains, roof gutter runoff, cleanouts, pond or pool overflow drains, cross-connections with storm drains, and manhole covers. Infiltration and inflow tend to affect only older sewer systems, particularly during or following heavy rain events. Average Dry Flows (ADF) and total capacity are considered when determining the overall treatment plant condition.

5.2.2 - SERVICE CONNECTIONS

Each wastewater service provider provides services to various land uses within its boundaries. Wastewater service providers often categorize these land use types into three categories (residential, commercial/institutional, industrial). There are few exceptions statewide that significantly deviate from the service connection pattern seen when observing the wastewater service providers in Alameda County. The majority of connections are to residential uses, with commercial/institutional second and industrial last.

5.2.3 - FLOWS AND CAPACITY

Table 5-3 lists the daily peak flow of the wastewater treatment facilities compared to the total daily capacity in order to determine the ratio between the two. The California Regional Water Quality Control Board requires that the ratio remains under 0.80.

**Table 5-3
Daily Peak Flow and Total Capacity Comparison (mgd)**

Provider	Average Dry Flow	Total Daily Capacity	Ratio
Hayward	10.0	18.5	0.54
Livermore	3.3	8.5	0.38
San Leandro	4.3	7.6	0.56
Castro Valley Sanitary District (CVSD)/ Oro Loma Sanitary District (OLSD)	10.3	20.0	0.52
Dublin San Ramon Sanitary District (DSRSD)	9.7 ¹	20.2	0.4
East Bay Municipal Utility District (EBMUD)	54	168	0.32
Union Sanitary District (USD)	23.2	33	0.65

Note: ¹ Includes the average dry weather effluent flow

Source: City of Livermore R2-2017-0018, DSRSD R2-2017-0017, EBDA R2-2017-0016 (for Hayward, San Leandro, CVSD/OLSD, USD), EBMUD R2-2020-0024, 2015 EBMUD UWMP

5.2.4 - SLUDGE AND BIOSOLIDS MANAGEMENT

City of Hayward

Sludge at the City of Hayward Water Pollution Control Facility is anaerobically digested, dewatered in dewatering beds, and air-dried for up to two years. The City hauls dried biosolids to an authorized disposal site for use as alternative daily cover.

City of Livermore

Sludge is anaerobically digested and dewatered using belt filter presses. The dried biosolids are hauled to an authorized disposal site.

City of San Leandro

Sludge at the City of San Leandro Water Pollution Control Plant is anaerobically digested, dewatered using a belt filter press, and air-dried. The City hauls dried biosolids to an authorized disposal site or applies the biosolids to land as Class A Exceptional Quality biosolids.

East Bay Municipal Utility District

EBMUD management practices include benchmarking, annual personnel performance evaluations, annual financial audits, and financial trend and budget performance reports. The District’s service operations are also routinely evaluated. The District has developed performance indicators to monitor workload for specific areas as well as district-wide planning and goal setting. The performance indicators track productivity and error rates for the various types of work performed.

EBMUD's Water Master Plan was updated in 2020 and has a planning horizon of 10 years. EBMUD has also implemented a Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan. EBMUD conducts capital improvement planning over a five-year planning horizon; its most recent plan was prepared in FY 2022-2023. The District prepared its year 2020 Urban Water Management Plan (East Bay Municipal Utility District, 2020).

In the event of emergencies such as earthquakes, EBMUD has an emergency operations plan which describes the internal organization structure used in response to all emergencies, including regional power outages and earthquakes. The plan was last revised in 2020. EBMUD complies with the California Standardized Emergency Management System (SEMS), which includes all National Incident Management System (NIMS) guidance for federal emergency operations plans.

As one of the eight major water suppliers in the San Francisco Bay Area, EBMUD and other agencies recognize that in the event of a regional catastrophe, assistance from other local agencies is not guaranteed. To mitigate the risk of limited access to local mutual aid, EBMUD entered into a Multiagency Mutual Assistance Agreement with the Los Angeles Department of Water and Power and with Las Vegas Valley Water District to mutually supply as much of the requested resources as possible to the other agency, if a regional disaster impacts only one of the agencies (East Bay Municipal Utility District, 2020). Chapter 3 of the District's Urban Water Management Plan explains its emergency response plan in more detail.

Sludge is thickened, blended, anaerobically digested, and dewatered before reuse by land application, compost, or alternate daily cover in an authorized landfill.

Dublin San Ramon Sanitary District

Sludge is thickened by dissolved air floatation, anaerobically digested, and treated in six onsite sludge lagoons for approximately five years. The treated sludge is injected into the soil at an onsite disposal area.

Oro Loma and Castro Valley Sanitary Districts

Sludge at the Oro Loma and Castro Valley Sanitary Districts Water Pollution Control Plant is anaerobically digested, dewatered using a belt filter press, and air-dried in a solar drying facility. The Districts haul dried biosolids to farmland in Northern California to be beneficially reused for land application.

Union Sanitary District

Sludge at the Raymond A. Boege Alvarado Wastewater Treatment Plant is thickened, anaerobically digested, and dewatered using centrifuges. The Union Sanitary District hauls dried biosolids to an authorized disposal site. Up to 25 percent of the biosolids are composted offsite to make Class A Exceptional Quality biosolids.

5.3 - Infrastructure Needs or Deficiencies

Agencies must monitor and maintain their sewer systems to reduce inflow and infiltration and assure they can maintain adequate capacity for current and future flows.

5.3.1 - REGIONAL FACILITIES

Regional wastewater facilities can include treatment facilities, outfalls, and pipelines. Needs for infrastructure are primarily based on the increase in the population each agency services. As the population increases, the need for treatment and disposal services increases as well. Understanding the relationship between projected population growth, capacity, and the year of construction (see Table 5-4) can assist in forecasting or identifying infrastructure needs or deficiencies.

**Table 5-4
Wastewater Facilities in Alameda County (mgd)**

Operator	Facility	Capacity (ADWF)	Year Built
Hayward	Hayward WPCF	18.5 mgd	1952 ²⁶
Livermore	Livermore Water Reclamation Plant	8.5 mgd	1958 ²⁷
San Leandro	San Leandro WPCP	7.6 mgd	1939 ²⁸
DSRSD	Wastewater Treatment Plant	20.2 mgd	1961
EBMUD	EBMUD Main WWTP	168 mgd	1971
OLSD/CVSD	Oro Loma/CVSD WWTP	20 mgd	1968
USD	Alvarado WWTP	33 mgd	1981
EBDA	Marina Dechlorination Facility/Joint Outfall	79.1 mgd	1974
LAVWMA	Export Pipeline	28.7 mgd	2003

Source: Hayward WPCF Master Plan, Livermore General Plan, Livermore Sewer System Master Plan, San Leandro General Plan and WPCP Master Plan, EBMUD UWMP, OLSD Sewer System Management Plan, LAVWMA SB 1266 compliance letter, EBDA NPDES letter, Alvarado Treatment Plant website

Dublin San Ramon Services District

DSRSD is the purveyor of wastewater collection and treatment services in Dublin and Pleasanton and a portion of San Ramon. Disposal of treated wastewater is under the jurisdiction of LAVWMA. The plant has a rated dry weather capacity of 20.2 million gallons per day (mgd). This total is split between an average daily dry weather design flow of 17.0 mgd and 3.2 mgd of reverse osmosis reject water from Zone 7. Disposal of treated effluent from the Treatment Plant in Pleasanton is the responsibility of LAVWMA, who exports

²⁶ Major renovation completed.

²⁷ Major renovation completed in 1993.

²⁸ Major renovation completed in 2017.

secondary treated wastewater to the EBDA interceptor pipeline for ultimate discharge to Marina Dechlorination Facility then San Francisco Bay via a deep-water outfall (Dublin San Ramon Services District, 2012). This allows the District to adequately serve its boundary and account for growth. Expansion may be required after the projected buildout date.

East Bay Municipal Utility District

EBMUD management practices include benchmarking, annual personnel performance evaluations, annual financial audits, and financial trend and budget performance reports. The District's service operations are also routinely evaluated. The District has developed performance indicators to monitor workload for specific areas as well as district-wide planning and goal setting. The performance indicators track productivity and error rates for the various types of work performed.

EBMUD's Water Master Plan was updated in 2020 and has a planning horizon of 10 years. EBMUD has also implemented a Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan. EBMUD conducts capital improvement planning over a five-year planning horizon; its most recent plan was prepared in FY 2022-2023. The District prepared its year 2020 Urban Water Management Plan (East Bay Municipal Utility District, 2020).

In the event of emergencies such as earthquakes, EBMUD has an emergency operations plan which describes the internal organization structure used in response to all emergencies, including regional power outages and earthquakes. The plan was last revised in 2020. EBMUD complies with the California Standardized Emergency Management System (SEMS), which includes all National Incident Management System (NIMS) guidance for federal emergency operations plans.

As one of the eight major water suppliers in the San Francisco Bay Area, EBMUD and other agencies recognize that in the event of a regional catastrophe, assistance from other local agencies is not guaranteed. To mitigate the risk of limited access to local mutual aid, EBMUD entered into a Multiagency Mutual Assistance Agreement with the Los Angeles Department of Water and Power and with Las Vegas Valley Water District to mutually supply as much of the requested resources as possible to the other agency, if a regional disaster impacts only one of the agencies (East Bay Municipal Utility District, 2020). Chapter 3 of the District's Urban Water Management Plan explains its emergency response plan in more detail.

Oro Loma Sanitary District/Castro Valley Sanitary District

The OLSD/CVSan Treatment Plant treats an average dry weather flow of 12.4 million gallons per day. The plant treats the wastewater to a secondary level through physical, biological, and chemical processes. Treatment includes running wastewater through bar screens and grit chambers and then held in primary clarifiers. Once the debris has settled, the wastewater enters the secondary treatment process and is transported to the aeration basins, secondary clarifiers, and disinfection tanks. Once the effluent meets all

requirements set by the RWQCB, it is pumped to EBDA for discharge. The plant was significantly upgraded in 2006 and again in 2020. It now provides Advanced Secondary Treatment (Nitrification/Denitrification), a first in Alameda County and one of three plants in the San Francisco Bay Area. The District is also working with partners on the shoreline to plan and respond to sea rise. In partnership with CVSan, Oro Loma constructed a demonstration of a leading alternative to respond to sea rise. OLSD has partnered with UC Berkeley to assess the performance of the demonstration and advance the science of sea rise response.

During an exceedingly wet weather period in 1998, the plant recorded a one-day flow of 75.3 mgd. Due to significant pipe replacements and a wet weather storage basin installed in 2013, peak wet weather flows are now rarely above 30 mgd.

In 2015, an eight million gallon equalization basin was constructed to store peak flows during storms. Combined with targeted upgrades in the collection system, peak flows to the treatment plant have been cut by nearly one-half over the past 25 years.

Prior to July 2020, the District had the disposal capacity to send 69.2 mgd to the EBDA Marina Dichlorination Facility. As a result of the model, all the affected lines were either upsized or found to be adequate based upon subsequent storm flow monitoring. The results of the study showed that based on the 10-year, 24-hour design storm, the District would experience no sanitary sewer overflows due to capacity limitations (Oro Loma Sanitary District, 2021). The reduced capacity reflects the District's efforts to manage peak flows over the past 20 years. Effective in July 2020, the District has 30 mgd of capacity rights in EBDA.

Union Sanitary District

According to the 2002 Union City General Plan, based on land use projections, the District has sufficient capacity to meet demand due to most of the developable area in the City already being built out.

The Irvington Basin includes 302 miles of sanitary sewers or about 37 percent of the total length of the sewers in the District. The Newark Basin is in the center of the District's service area, with the Alvarado Basin to the north and the Irvington Basin to the south. The Newark Basin includes approximately 239 miles of sanitary sewers, or about 30 percent of the total length of the sewers in the District. The Alvarado Basin is the northernmost part of the District's service area. The Alvarado Basin includes 253 miles of sanitary sewers or about 32 percent of the total length of the sewers in the District. Flows from these basin areas are transferred to the Alvarado Pump Station. The wastewater is then treated at the District's Wastewater Treatment Plant. Then EBDA provides disposal services, some of which are disposed to a 145-acre fresh to saltwater marsh pursuant to the Hayward Marsh Expansion Project.

5.3.2 - MULTIPURPOSE AGENCIES/SERVICE AREA

City of Hayward

The Hayward WPCF has a design capacity of 18.5 mgd ADWF. According to the WPCF's NPDES permit (R2-2017-0016), the average dry flow is 10.0 mgd. Secondary treatment is provided by the WPCF existing biological treatment process, which is comprised of trickling filter/solids contact and secondary clarification. Treated effluent is chlorinated prior to being pumped into the EDBA common effluent pipeline and then dechlorinated at the Marina Dechlorination Station before being discharged into the San Francisco Bay.

City of Livermore

All sewage generated in the City of Livermore is collected for treatment at the Livermore Water Reclamation Plant operated and maintained by the City's Water Resources Division. The Water Reclamation Plant's approximate capacity is 8.5 mgd. The average dry weather flow is 3.3 mgd. Treatment consists of grit removal, primary clarification, secondary clarification, and disinfection. The treated wastewater that is not recycled is sent through the LAVWMA pipeline for disposal in San Francisco Bay. LAVWMA and EBDA provide the disposal of wastewater in the City. The City's wastewater service area includes all of Livermore except agricultural areas. Expansions have been planned, according to the City of Livermore's General Plan and LAVWMA's expansion from 21 mgd to 41.2 mgd.

According to Livermore's Sewer Master Plan, which references the 2012 Treatment Plant Master Plan and a 2006 Wastewater Disposal Master Plan, it indicates the City to be in adequate capacity in its collections system. Also, the collection system received very low levels of infiltration and inflow during wet weather events (City of Livermore, 2019).

City of San Leandro

About two-thirds of the City, including most of northern and central San Leandro, is served by a City-owned and operated system. The remainder is served by OLSD. The plant provides secondary treatment through physical, biological, and chemical processes. This includes screening, grit removal, sedimentation, fixed film reactor, activated sludge, secondary clarification, and disinfection by sodium hypochlorite. Most of the treated effluent is transported to a large pipeline shared by multiple treatment plants in Alameda County and is then discharged approximately seven miles offshore. The plant processes secondary effluent at a rate of 4.9 mgd. No expansions have been planned according to the San Leandro General Plan. EBDA provides the disposal of wastewater in the City. San Leandro has adequate dry weather capacity to accommodate projected growth. In the event of extreme weather events, the level of treatment may be temporarily reduced, and lower quality wastewater may be discharged to the Bay (City of San Leandro, 2017).

LAVWMA

LAVWMA is a JPA comprised of the cities of Livermore and Pleasanton along with DSRSD. LAVWMA was created in 1974 to transport treated wastewater from Livermore, Pleasanton, and DSRSD to San Francisco Bay. Key infrastructure includes the 15.6 miles of 24- to 36-inch export pipeline and wet weather outfall. The facilities pass through Pleasanton, Castro Valley, San Lorenzo, and San Leandro. EBDA then handles the discharge of the treated wastewater. LAVWMA facilities are designed to export a maximum flow of 41.2 mgd during wet weather events.

Only during wet weather events, LAVWMA will be required to store flows or temporarily discharge to San Lorenzo Creek and Alamo Creek. LAVWMA has a separate NPDES permit (No. CA0038679) issued by the RWQCB (No. R2-2016-0015), which allows discharge of up to 21.5 mgd of dechlorinated effluent into the San Lorenzo Creek. Similarly, only during wet weather events, the permit allows up to 55 mgd discharge to Alamo Canal mgd. To this date, no such discharge has ever occurred to Alamo Canal.

EBDA

The EBDA operates the Bay outfall diffuser and the Marina Dechlorination Facility. The combined flows, all from EBDA and LAVWMA facilities, are combined and dechlorinated using sodium bisulfite. Once the combined effluent is at the compliance point for water quality, it will ultimately discharge into San Francisco Bay. The average dry weather flow is approximately 45 mgd (EBDA.org, 2019).

5.3.3 - COLLECTION SYSTEMS

The wastewater collection service that is provided by the agencies below maintains and extends sewer pipes and pump stations to convey wastewater to treatment facilities. Table 5-5 details the number of pump stations and sewer pipe miles for each agency.

The City of Alameda has 136 miles of sewer pipeline with over 10 miles of pipelines and seven pump stations that are a part of EBMUD. There are also approximately 16 miles of privately-owned sewers that are the responsibility of individual homeowner's associations. The City has rehabilitated or replaced over 20 percent of its sewer pipelines and associated lower laterals over the past 30 years (City of Alameda, 2017). Rehabilitation of the sewer pipelines and retrofitting its sewer pump stations will be required in order to reduce instances of infiltration and inflow.

The City of Albany owns and maintains approximately 32 miles of sewer main. These pipelines discharge into an EBMUD trunk sewer. The oldest portions of the system date to the early 1900s; however, over 50 percent of the system has been rehabilitated or replaced in the past 30 years, so that the average age of the sewer system is now about 50 years. The rest of the sewer system will be slated for rehabilitation (City of Albany, 2019).

**Table 5-5
Current Collection Facilities**

Operator	Pump Stations	Pipe Miles
Alameda	42	136
Albany	N/A	32
Berkeley	7	254
Emeryville	1	15
Hayward	9	337
Livermore	4	304
Oakland	7	930
Piedmont	N/A	50
Pleasanton	11	252
San Leandro	13	130
Castlewood CSA	0	4
CVSD	9	160
DSRSD	2	187
EBMUD	15	29
OLSD	13	272
USD	3	786

Source: Hayward WPCF Master Plan, Livermore General Plan, Livermore Sewer System Master Plan, San Leandro General Plan WPCP Master Plan, EBMUD UWMP and PSMP 2015, CVSD Sewer System Master Plan 2018, DSRSD Sewer System Master Plan 2012, OLSD Sewer System Master Plan 2015, OLSD Sewer System Master Plan 2019, USD Alvarado, Newark, Irvington Basin Sewer System Master Plan 2017, 2015, and 2012.

The City of Berkeley includes approximately 254 miles of sanitary sewer pipelines and seven pump stations. The collection system serving the University of California at Berkeley (UCB) campus, located within the City, is owned and maintained by the University but discharges to the City's sewer system, as do the sewer systems serving the Lawrence Berkeley National Laboratory (LBNL) and Golden Gate Fields. The City also receives wastewater from small adjacent areas of the City of Albany, City of Oakland, and the Stege Sanitary District (Kensington). According to information provided by the City of Berkeley's Sanitary Sewer Recent Rehabilitation Maps, the majority of pipes that are slated for rehabilitation are located in the western portion of the City. It appears that the northern portion of the City has the most length of pipeline that has not been rehabilitated since 2015 (City of Berkeley, 2019). The City is updating its master plan, and it should be completed in 2021. The master plan will include a prioritization process for identifying areas where additional pipe capacity is needed.

The City of Emeryville's wastewater collection system consists of 15 miles of gravity sewers and one pump station. Over 85 percent of the pipes installed before 1970 have been replaced or fully rehabilitated. This rehabilitation program has resulted in a reduction of modeled wet weather flows of about 10 percent based on Emeryville's peak wet weather flow allocation. In addition, all wet weather overflows have been eliminated from the wastewater collection system. Any pipes with hairline cracks that do not show appreciable change after FY 2021-2022 system-wide CCTV inspection will be placed on a 10-year inspection cycle (City of Emeryville, 2014).

The City of Hayward's wastewater collection system consists of approximately 337 miles of sewer pipelines and nine sewage pump stations. The collection system conveys wastewater flows to the City's Water Pollution Control Facility. The City should conduct additional flow monitoring or document flow levels during large storm events at locations in the system where the model predicts significant surcharge. The alignments and sizes of all recommended projects should be verified with detailed predesign analyses, including topo surveys, geotechnical investigations, utility research, and constructability reviews. When paralleling or replacing existing sewers, consider the physical condition and remaining useful life of the existing pipelines, the availability of pipeline corridors for new sewer construction, and operation and maintenance concerns (City of Hayward, 2016).

The City of Livermore's collection system operates and maintains 294 miles of pipeline and four sewer lift stations and approximately two miles of 10- and 12-inch force mains. Sewage generated in the City of Livermore is collected for treatment at the Livermore Water Reclamation Plant operated and maintained by the City's Water Resources Division. The treated wastewater that is not recycled is sent through the Livermore-Amador Valley Water Management Agency (LAVWMA) pipeline for disposal into the San Francisco Bay. During a hydraulic analysis of Livermore's gravity, mains identify every incidence of the design and performance criteria being exceeded. In most of these incidences, the performance criteria are exceeded in an isolated gravity main that has a low or even flat slope. It is anticipated that these identified gravity mains do not represent true hydraulic bottlenecks in the collection system; however, it is recommended that in the future, Livermore perform field verification of these isolated mains so their true capacity can be determined (City of Livermore, 2019).

The City of Oakland owns, operates, and maintains a local sanitary sewer collection system covering approximately 48 square miles and includes over 934 miles of sanitary sewer lines, 29,000 structures, and 11 pump stations. Many of the lines pre-date 1938. The City of Oakland's General Plan indicates that the sewer pipes are in poor condition; many laterals are determined as plugged or abandoned, while others do not have data available (City of Oakland, 2014). The City of Oakland is currently working on a Sewer Master Plan.

The wastewater generated within the City of Piedmont is collected in approximately 50 miles of sanitary sewer pipelines, ranging from six to 21 inches in diameter, built mainly between the years 1900 to 1940. The population of Piedmont is not expected to grow significantly and has remained relatively stable over the last 50 years because of the lack of additional land for development and zoning restrictions. Because growth and the opportunity for growth in the City are limited and future land use patterns are not expected to change significantly, no extra allowance for growth was considered in calculating the base sanitary sewer flow for the future. Therefore, it is concluded that the sanitary sewer improvements implemented in recent years and scheduled for the future should address the current and future capacity requirements for the collection system facilities for a five-year storm event (City of Piedmont, 2014).

The City of Pleasanton's collection system serves the City and some additional areas outside the city limits. The collection system consists of approximately 6,500 manholes and

270 miles of public sewer, most of which is less than 30 years old. The City area is relatively flat and low in elevation, except for the hills in the western and southern portions. The City currently operates and maintains 10 wastewater pump stations. The City also receives wastewater that is generated from the Castlewood CSA (City of Pleasanton, 2014). Overall, Pleasanton's collection system has adequate capacity to convey ADWFs. Few deficiencies exist under dry weather flow conditions. Capacity deficiencies under AWWF conditions represent less than 10 percent of the modeled collection system. The relatively few number of deficiencies can be attributed to a well-designed system without significant problems.

The City of San Leandro's sewer system consists of approximately 130 miles of pipe, ranging from six inches to 42 inches in diameter, and 13 remote lift stations. The sewers in the City system range in age from new to over 70 years old. The oldest sewers are located in the northeastern portion of the City from the Oakland city limits to Castro Street, roughly between the Southern Pacific Railroad and MacArthur Boulevard. This portion includes the downtown area and the oldest residential areas of the City (City of San Leandro, 2017). There are roughly two-thirds of the sewers within the city limits, primarily serving the northern portion of the City. The remainder of the City is served by the OLSD. Sewage is then transported to and treated at the San Leandro Water Pollution Control Plant. San Leandro will continue to determine the frequency of future cleaning and maintenance based on the results of CCTV inspections. In the future, some pipe reaches may need inspecting every 10 years. San Leandro will continue to determine the frequency of future cleaning and maintenance based on the results of CCTV inspections (City of San Leandro, 2017).

The Castro Valley Sanitary District's (CVSD) wastewater collection system is approximately 160 miles of sewers and nine pump stations together with five miles of outfall sewer lying outside the District's boundary. Wastewater from the District is treated under contract by OLSD at the Oro Loma/Castro Valley Water Pollution Control Plant in San Lorenzo, of which CVSD owns 25 percent. Before implementation of the I-580 Relief Sewer Project, additional flow monitoring is recommended to confirm the size and scope of this project. In addition, monitoring is recommended on the Stanton Avenue and Lake Chabot Road trunk lines to verify that the surcharging indicated by PWWF modeling is not severe enough to justify capital improvements. Continue the use of smoke testing in an attempt to identify the source of I&I. Expand the funds provided for private sewer lateral inspection and rehab (Castro Valley Sanitary District, 2018).

The Dublin San Ramon Services District's wastewater collection system consists of two stations and 187 miles of pipelines ranging in size from six to 42 inches in diameter. The collection system includes two inverted siphons and two creek crossings that are within the open channel. DSRSD's collection system is in good condition, and relatively few needed repairs have been identified through previous CCTV inspections. The District has been able to fund and construct all needed repairs as they are identified (Dublin San Ramon Services District, 2012). In 2017, DSRSD completed the Dublin Trunk Sewer Rehabilitation Project, which lined 7,945 feet of 33- to 42-inch diameter trunk sewer.

East Bay Municipal Utility District's sewer collection system, along with interceptors and wet weather facilities, includes approximately 29 miles of gravity interceptors, eight miles of forced mains, 15 pump stations, and three wet weather facilities (East Bay Municipal District, 2015). The oldest pump stations were built in the early 1950s, and all, except for a single pump station, have been refurbished over the years (East Bay Municipal Utility District, 2016).

The Oro Loma Sanitary District collection system consists of 272 miles of public sewer, 32,000 building service connections, 12 remote lift stations, and 54 critical structures, such as diversion boxes, aerial sewers, and siphons. The average age of the collection system is 51 years. The pipes are predominantly vitrified clay pipe (VCP) with cement mortar joints. For new pipes installed today, the standard is eight-inch PVC. For rehabilitated pipes, the typical replacement is with eight-inch HDPE. The District has an aggressive televised inspection program. It assesses the condition of every foot of its 270 miles of pipe every 2.5 years. Identified defects are scheduled for repair or line replacement. The District has been replacing one percent of its system per year for the past 10 years and plans to increase the pace to 1.5 percent/year over the next 10 years. The District maintains a high-performing collection system, regularly achieving less than one sewer overflow per 100 miles of collection system per year. (Oro Loma Sanitary District, 2021).

The Union Sanitary District collection system is comprised of three major drainage basins: Alvarado, Newark, and Irvington. The Alvarado Basin includes 253 miles of sanitary sewers. The Alvarado Basin also includes the Paseo Padre Lift Station, which serves a small area in the southwestern corner of the basin. All flows from the basin are conveyed to the Alvarado Pump Station, which is located at the District's Alvarado Wastewater Treatment Plant (WWTP) site. The Irvington Basin includes 302 miles of sanitary sewers. Other than a small area on the northwestern edge of the basin that drains to the Cherry Street Pump Station, all flows from the Irvington Basin are conveyed to the District's twin force mains, through which they are conveyed to the Alvarado WWTP. Under certain flow conditions, flows from the Irvington Pump Station may be routed to the Newark Pump Station. The Newark Basin includes approximately 231 miles of sanitary sewers or about 29 percent of the total length of the sewers in the District. Currently, all flows from the Newark Basin is conveyed to the Alvarado WWTP (Union Sanitary District, 2018).

5.3.4 - OPPORTUNITIES FOR SHARED FACILITIES

Municipal wastewater providers practice extensive facility sharing.

- Sustain the level of communication between service providers.
 - City of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont at Technical Advisory Board meetings.
- The City of Alameda to increase communication with neighboring service providers at the BACWA collection system monthly meetings.
- DSRSD-EBMUD Recycled Water Authority (DERWA) District entered into a joint powers agreement and established the purpose of creating a recycled water program to reduce the total amount of wastewater.

- EBMUD and the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont are members of the East Bay communities JPA, which are in EBMUD's sewer service area. The JPA has conducted infiltration and inflow studies to identify problems and plan for needed capital improvements.
- USD, OLSD, CVSD, Hayward, and San Leandro share the Bay outfall diffuser and the Marina Dechlorination Facility through participation in EBDA.
- DSRSD, Livermore, and Pleasanton share a wastewater conveyance pipeline through LAVWMA's export pipeline. DSRSD operates and maintains the LAVWMA effluent export pipeline by contract. LAVWMA contracts with EBDA for disposal services.
- OLSD and CVSD jointly own a wastewater treatment plant.
- DSRSD provides treatment services to the City of Pleasanton by contract.
- Pleasanton conveys Castlewood CSA wastewater to the DSRSD Treatment Plant by contract.
- By contract, San Leandro, Hayward, OLSD, and USD provide operation and maintenance services to EBDA.
- EBMUD constructed the San Leandro Reclamation Facility to serve EBMUD customers with recycled water produced by the San Leandro Waster Pollution Control Plant. San Leandro supplies recycled water to EBMUD for distribution to irrigation accounts.
- The San Ramon Valley Recycled Water Program (SRVRWP) is a partnership between EBMUD and DSRSD to provide recycled water to both agencies' customers.
- EBDA, Union Sanitary District, and the East Bay Regional Parks District uphold the MOU regarding the operation and maintenance of the Hayward Marsh and the accompanying NPDES permit (CA0038636).
- Livermore, Pleasanton, and DSRSD are some of the parties to the Tri-Valley Intergovernmental Reciprocal Services Agreement, which allows for sharing of resources (and contracting between the agencies) as agreed to by Task Orders.
- In 2014, the City of Pleasanton and DERWA entered into an agreement for Pleasanton to be a wholesale recycled water customer of DERWA.
- DSRSD conveys brine from Zone 7 facilities that are ultimately disposed of in the LAVMWA export facilities.

There are several agencies with excess capacity in their treatment facilities (EMBUD, potentially Livermore, and OLSD). These agencies can enter into agreements with agencies that are near or consistently exceeding their facility capacity to reduce the strain on the infrastructure.

5.4 - Service Standards and Adequacy

It is necessary to analyze the adequacy of the facilities presented by each agency that provides wastewater facilities and to assess their infrastructure deficiencies and needs in order to meet the populace. Adequacy can be determined by factors including regulatory compliance, sewer overflows, treatment effectiveness, collection system integrity, response times, and source control programs.

5.4.1 - REGULATORY OVERVIEW

The Federal Water Control Pollution Act, also known as the Clean Water Act, was passed in 1972 by the U.S. Congress. The law established water quality standards to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The law established the permit system known as the National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into surface waters. The Clean Water Act authorized the EPA to set water quality standards for all contaminants in surface waters (United States Environmental Protection Agency, 2019). The standards specify maximum contaminant levels (MCLs) for treated wastewater prior to discharge.

Furthermore, in 1972, the California legislature amended the Porter-Cologne Water Quality Control Act of 1969 to allow the State Water Resources Control Board (SWRCB) to assume the responsibilities prescribed in the Clean Water Act. This signified that SWRCB and its nine regional control boards would regulate federal and State water quality standards as well as operate the federal permit process for discharging pollutants into open waters. NPDES permits establish specific discharge limits and monitoring and reporting requirements and may also require facilities to undertake special measures to protect the environment from harmful pollutants (State Water Resource Control Board, 2019).

The Clean Water Act requires that all point source wastewater dischargers obtain and comply with an NPDES permit. NPDES permits regulate discharges from publicly owned wastewater treatment facilities, other wastewater treatment facilities, industrial facilities, concentrated animal feeding operations, aquaculture, and other "point source" dischargers.

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

In 2014, a Consent Decree was reached between the EPA, the California State Water Resources Control Board, SF Baykeeper, Our Children's Earth Foundation, the East Bay Municipal Utility District, the Stege Sanitary District, and the Cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont. The Decree requires the respondents to continue updating sewer infrastructure to help protect San Francisco Bay.

In 2018, the SWRCB adopted Resolution No. 2018-0019, which amends the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS). This resolution amends resolution 2012-0032, adopted in 2012, authorizes subsurface disposal of domestic strength, and in limited instances high

strength, wastewater and establishes minimum requirements for the permitting, monitoring, and operation of OWTS for protecting beneficial uses of waters of the State and preventing or correcting conditions of pollution and nuisance. The policy also conditionally waives the requirement for owners of OWTS to apply for and obtain Waste Discharge Requirements (WDRs) to operate their systems if they meet the conditions set forth in the policy. The policy applies to OWTS on federal, State, and tribal lands to the extent authorized by law or agreement (State Water Resource Control Board, 2018).

To provide a consistent, statewide regulatory approach to address sanitary sewer overflows (SSOs), the SWRCB adopted Statewide General Waste Discharge Requirements (WDRs) for Sanitary Sewer Systems (SSS), Water Quality Order No. 2006-0003 (Sanitary Sewer Systems WDR) in 2006. The Sanitary Sewer Systems WDR requires public agencies that own or operate sanitary sewer systems to develop and implement Sewer System Management Plans and report all SSOs to the State Water Board's online SSO database.

The purpose of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. The SSMP policy requires dischargers to provide adequate capacity in the sewer collection system, take feasible steps to stop sewer overflows, identify and prioritize system deficiencies, and develop a plan for disposal of grease, among other requirements. Wastewater collection providers in Alameda County have been reporting overflows under the new requirements and have Sewer System Management Plans in place (State Water Resource Control Board, 2006).

RWQCB enforces the Clean Water Act, California's Porter-Cologne Water Quality Control Act, NPDES permit conditions, and other requirements of wastewater providers. RWQCB regulates wastewater discharges to surface waters, like San Francisco Bay, through the NPDES Program. Stormwater is also subject to NPDES regulations, but it is regulated separately. Some wastewater discharges are exempt from federal NPDES requirements, but California law may still apply. Under California law, the RWQCB requires WDRs for some discharges in addition to those subject to NPDES permits.

The RWQCB employs a pretreatment program and a pollution prevention program for all municipal wastewater purveyors. The practice of removing pollutants from industrial wastewaters before they are discharged into municipal sewage treatment systems is known as "pretreatment." In focusing on industrial sources, pretreatment differs from pollution prevention, which focuses on residential and commercial sources. The RWQCB's pretreatment program includes pretreatment compliance audits and inspections, annual and semiannual report reviews, program modifications, and enforcement activities. Pollution prevention is reducing or eliminating waste at its source by modifying production processes, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques, and reusing materials rather than putting them into a waste stream (Regional Water Quality Control Board - San Francisco, 2019).

The RWQCB specifically defined pollution prevention in Resolution R2-2003-0096 to include any action that causes a net reduction in the use or generation of a hazardous substance, or other pollutant discharged into water. Pollution prevention does not include

actions that merely shift a wastewater pollutant from one environmental medium to another without a clear environmental benefit (Regional Water Quality Control Board - San Francisco, 2018). This spurred the collaboration of wastewater dischargers to form the Bay Area Pollution Prevention Group. This developed and implemented pollution prevention strategies and exchanged information to coordinate pollution prevention efforts. The group is composed of many agencies that provide services in Alameda County, including the Central Contra Costa Sanitation District, DSRSD, EBMUD, Hayward, Livermore, and San Leandro.

5.4.2 - REGULATORY COMPLIANCE STATUS

As previously mentioned, the State and Regional Water Quality Control Boards enforce the pollution control and cleanup requirements that are established for discharges and contaminated sites. Where violations of regulatory requirements are detected, enforcement actions of varying types and levels of stringency are taken. For the most serious violations, penalties are often imposed. The RWQCBs also collaborate with federal, State, and local law enforcement, as well as other environmental agencies, to address violations. In all cases, the principal goal of enforcement is to encourage compliance with requirements so that water quality is protected. Violations of water pollution control requirements can vary from not submitting monitoring reports on time, to exceeding limits for discharged pollutants, to causing fish kills. The RWQCBs address violations by using progressive levels of enforcement, considering actual or potential impact to the State's waters, as needed to achieve compliance.

RWQCB enforcement actions can be informal or formal. Informal actions are intended to bring an actual, threatened, or potential violation to the discharger's attention to provide an opportunity to return to compliance as soon as possible. Informal actions include phone calls, emails, staff enforcement letters, and notices of violation. Formal actions are administrative or judicial actions that seek to impose sanctions where an adjudicative hearing is available to contest the allegations. The actions can include investigatory orders, cleanup, abatement orders, cease and desist orders, and orders imposing administrative, civil liability (or ACL, which involves monetary penalties). For formal actions, a hearing before the Regional Water Board may be necessary. Ideally, serious violations must result in fair and appropriate consequences for violators, including consistent application of penalties and other wide-ranging sanctions available to the Water Boards by law (California State Water Resource Control Board, 2018).

The cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont have been ordered to remedy excessive infiltration and inflow into their collection systems. The cities are within the East Bay Municipal Utilities Infiltration and Inflow Correction Program. This program is designed to eliminate overflows from sanitary sewer systems owned and operated by the mentioned cities.

All wastewater service providers within Alameda County are in compliance with the RWQCB to complete a Comprehensive Master Plan pertaining to its sewer systems and

include a Sewer Overflow Emergency Response Plan Element for SSO reporting (State Water Resource Control Board, 2006).

Along with the Water Boards, publicly owned treatment works also have a key enforcement role with respect to source control enforcement. EBMUD comprehensively regulates industrial and commercial discharges to the sanitary sewer system and follows up with appropriate action when those entities violate their permits.

The City of Alameda is upgrading its sewer system. However, it will need to renew its NPDES permit since it has passed the five-year life span of the previous permit per the City of Alameda Sewer System Management Plan.

The City of Albany has depicted goals with implementation measures to provide adequate capacity to convey peak flows associated with the design identified in the East Bay I/I Correction Program.

The City of Berkeley is under an RWQCB order to upgrade its sewer system to eliminate infiltration and inflow.

The City of Emeryville is under an RWQCB order to upgrade its sewer system to eliminate infiltration and inflow through their Sewer System Master Plan and in compliance with Order No. R2-2009-0004.

In accordance with the NPDES permit, the City of Oakland is in overall compliance with the Sanitary Sewer Collection System Annual Report (City of Oakland, 2019). The cumulative sewer rehabilitation work is significantly ahead of schedule, and the City's sewer budget, staffing, and equipment increased in 2017 pursuant to RWQCB orders.

The City of Piedmont, pursuant to the NPDES and consent order, continues to update its sewer infrastructure in order to eliminate I/I and other emergencies. The City has rehabilitated more than 85 percent of its sanitary sewer system and is ahead of the requirements of the 2014 consent decree. The City is currently in the planning stages of the sixth phase of sewer rehabilitation out of seven total phases. Construction is expected to begin on the sixth phase in 2022.

The City of Hayward is subject to the NPDES issued by the San Francisco RWQCB. The City conducts reporting sanitary sewer overflows per its Sanitary Sewer Overflow Emergency Response Plan. The City's Treatment Facility meets all the NPDES requirements; however, the RWQCB will lower discharge limits for pollution as identified in the City's Urban Water Management Plan.

The City of Livermore does not report any discrepancies with its sewer system. The City's Sewer System Master Plan undergoes an audit every two years. This ensures the effectiveness of the plan. The City will update its plan approximately every five years. The City is due to have its plan updated.

The City of Pleasanton is in compliance with requirements from the RWQCB. Inflow and infiltration are not currently a significant issue even during rain events, according to the City's Sewer System Master Plan.

The City of San Leandro is in compliance with requirements from the RWQCB and with the development of its Sewer System Master Plan. The City employs an internal audit, evaluating the sewer system and the Master Plan's effectiveness. The City is nearing its next Master Plan Update. According to the biennial audit, the City's sewer system does not violate RWQCB regulations.

In total, Alameda County is within Region 2 of the State Water Resource Control Board. In relation to all other regions, it has the fifth most violations pertaining to enforcing the NPDES permits (California State Water Resource Control Board, 2018). The number of total violations documented in 2017 has dropped significantly since the high point in 2006. However, there was an increase in violations compared to 2016. Regions 4, 9, and 6B had the largest increase of violations compared to 2016.

Specifically, in Alameda County, there have only been eight violations linked to informal enforcement actions and three formal enforcement actions. All enforcement actions pertain to the EBMUD SD#1 wet weather bypass facility from 2006 to 2020 (California Environmental Protection Agency, 2020).

5.4.3 - TREATMENT EFFECTIVENESS

Wastewater treatment providers are required to comply with effluent water quality standards under the NPDES permit. In the previous MSR, DSRSD and OLSR reported an effectiveness rate of 99.5 percent. EBMUD and Livermore reported 100 percent compliance, San Leandro and USD reported 100 percent compliance but indicated that the point of compliance in the NPDES is located at EBDA rather than at the point of discharge from the treatment plant.

According to the CIWQS Project, EBMUD's Main Wastewater Treatment Plant, DSRSD's Wastewater Treatment Facility, San Leandro's Water Pollution Control Plant, Livermore's Water Reclamation Plant, and USD's Alvarado Treatment Plant is 100 percent in compliance with zero priority violations. Oro Loma has also maintained 100 percent compliance for the past 15 years. Furthermore, this takes into account San Leandro's and USD's discharge agreement with EBDA as the point of discharge.

5.4.4 - SEWER OVERFLOWS

Sewer overflows are commonly classified as discharges from sewer pipes, pumps, and manholes. A reduction in the size of sanitary system overflows (SSOs) and frequency will be progress towards the Sanitary Sewer Overflow Reduction Program as referenced in State Water Resource Control Board Resolution No. 2004-0080 (State Water Resource Control Board, 2004). Furthermore, the State Water Board General Order 2006-0003-DWQ requires operators of most sanitary sewer collection systems to report spill occurrences to

their regional board using CIWQS. They must also maintain an up-to-date questionnaire about their collection systems and certify that their management plan is appropriate, current, and fully implemented.

The agencies are required to report SSOs pursuant to State Water Board General Order 2006-0003-DWQ. Table 5-6 depicts the violations that were reported to CIWQS from 2006 to 2020. SSO reports within Alameda County were related to limitations or problems with the collection system under the control of the agency. This depicts the capacity and condition of collection system piping and the effectiveness of the current maintenance when reviewing the number of violations.

**Table 5-6
Sewer Overflow Rate 2006-2020**

Agency	Number of Violations
Alameda ²	7
Albany ¹	4
Berkeley ²	3
Emeryville ¹	5
Hayward	0
Livermore	0
Oakland ²	42 and 3 Class 2 violations
Piedmont ¹	1
Pleasanton	0
San Leandro ³	9
Castlewood CSA	0
CVSD ²	34
DSRSD	0
EBMUD ¹	10
OLSD	0
USD	0

Notes: when running the Violations Report from CIWQS there are two types of sewer systems to choose from. All agencies that do not have violations or have not submitted their SSO Report between 2006 through 2020.

¹ Small Municipal Sewer System

² Large Municipal Sewer Systems

³ According to the City

Source: California Integrated Water Quality System Project

According to CIWQS, a violation is an instance of non-compliance, and a Class 2 violation poses a moderate, indirect, or cumulative threat to water quality. Negligent or inadvertent non-compliance with the potential to cause or allow the continuation of unauthorized discharge or obscuring past violations are also Class 2 violations. Over the 14-year timespan, the City of Oakland and CVSD produced the most violations for large municipal sewer systems (State Water Resource Control Board, 2020). Out of the 42 violations for the City of Oakland, 25 violations were related to infrastructure failure, root intrusion, or debris. Two instances were caused by rainfall/rain events, and three were caused by sewer system overflows. In addition, Oakland had three Class 2 violations in 2010 that were caused by root intrusion, infrastructure failure, and debris blockage. CVSD had 34

violations within the 14-year timespan, 12 were related to infrastructure failure/debris or root intrusion, eight were related to rainfall/rain events, and three were related to overflows.

For small municipal sewer systems, EBMUD and the City of Emeryville recorded the most violations. EBMUD recorded 10 violations; out of those violations, five were due to rainfall/rain events, two system overflows, and one infrastructure failure. The City of Emeryville has recorded two infrastructure failures and one system overflow in five violations (State Water Resource Control Board, 2020).

Typically, root intrusions and rain events are unavoidable in certain regions; however, most of the causes of SSO violations can be decreased. Infrastructure failures can be decreased with proper maintenance and infrastructure upgrades. Debris creating blockages can be removed via a comprehensive street sweeping program or efficient emergency response team. Pursuant to SWRCB Permit Order No. 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, each agency is required to have a Sewer System Management Plan in place. This plan will set up goals and guidelines, increase efficiencies, and decrease violations. The amount of overflow violations is an improvement from the overflows measured in the previous MSR.

5.4.5 - RESPONSE TIMES

The wastewater collection systems, inherently, are subject to failures and overflows. Response policies and dispatch maintenance groups have been put together to make necessary repairs. Most agencies with an Overflow Emergency Response Plan have depicted the average times in which it takes from receiving an emergency call to responding to the issue.

In general, the agencies strive to provide rapid response. The agencies with larger service boundaries will have longer response times. The maximum time for any agency that depicts the response times is one hour, as shown in Table 5-7. The response time is critical to solving an issue because the quicker personnel can respond to a wastewater overflow or system failure, the faster the issue will be diagnosed, and necessary measures can be taken to remedy the issue.

OLSD and Hayward reported the quickest response times, responding to issues within 10 minutes to an hour. None of the providers that report the average response time stated it takes more than one hour.

City of Berkeley, City of Piedmont, City of Pleasanton, City of San Leandro, Castro Valley Sanitary District, and Dublin San Ramon Sanitary District did not clearly depict the average response times in their respective Sewer System Master Plan or Overflow Emergency Response Plan.

**Table 5-7
Sewer Blockage Response Time**

Agency	Response Time
City of Alameda ¹	N/A
City of Albany	30 minutes to one hour
City of Berkeley ¹	Immediate
City of Emeryville	one hour
City of Hayward	30 minutes to 1 hour
City of Livermore	one hour
City of Oakland	one hour
City of Piedmont ¹	N/A
City of Pleasanton ¹	N/A
City of San Leandro ¹	one hour
CVSD ¹	Dependent on priority
DSRSD ¹	N/A
OLSD	10 to 30 minutes
USD	one hour

Notes: ¹These agencies do not include or are not specific on the average response times within their respective Overflow Emergency Response Plan.

Source: City of Alameda SSMP 2017, City of Albany SSMP 2014, City of Berkeley SSMP 2019, City of Emeryville SSMP 2014, City of Hayward SSMP 2016, City of Livermore SSMP 2019, City of Oakland SSMP 2014, City of Piedmont SSMP 2014, City of Pleasanton SSMP 2018, City of San Leandro SSMP 2017, CVSD SSMP 2018, DSRSD SSMP 2012, OLSD SSMP 2019, Union Sanitary District SSMP 2017

5.4.6 - COLLECTION SYSTEM INTEGRITY

There are several ways to measure the integrity of a wastewater collection system: system demand (affected by population/economic growth), water usage, types of dischargers, and system deficiencies (SSO rate/inflow and infiltration rate), and inspection practices.

Based on a comparison between ADWF and PWWF, the City of Hayward, OLSD, and EBMUD have the largest discrepancies between the flow measurements. All of these discharges are required to comply with BMPs adopted by the SWRCB in order to reduce the frequency of infiltration and inflow, which are more prevalent during rain events (State Water Resource Control Board, 2009). The aforementioned agencies are a part of the Infiltration/Inflow Correction Program. According to CIWQS, several collection agencies (City of Hayward, City of Livermore, City of Pleasanton, Castlewood CSA, DSRSD, OLSD, and USD) have reported no major overflows where a significant amount of volume is lost in 14 years. Although infiltration and inflow rates are perceived as lower in the Tri-Valley area, the wastewater providers are actively addressing infiltration and inflow due to the limited wet weather treatment and disposal capacity in the area.

Since some agencies are not permitted to improve sewer systems on private property, there are reported efforts to encourage property owners to address infiltration and inflow on private sewer lines. Alameda and Albany require inspection and upgrade of deficient private sewers when properties transfer. CVSD inspects private lines and offers grant funds for the rehabilitation of deficient lines. These practices should be encouraged.

The SWRCB and EPA both recommend closed circuit television (CCTV) inspection of sewer lines as the most cost-efficient and effective inspection approach. On average, the wastewater provider conducts CCTV inspection of seven percent of its system annually and cleans 30 percent of the system annually. Collection system problems tend to be concentrated in older areas; it is most important to inspect lines more than 20 years old.

All sewer service providers in Alameda County conduct some level of CCTV inspection of sewer lines. For instance, the City of Piedmont calls for all mains to be internally inspected with CCTV on a 10-year cycle or about 26,000 linear-feet a year. Inspection results will determine the City's future inspection parameters (City of Piedmont, 2014). The City of Hayward conducts approximately 1.2 million linear feet of main cleaning footage a year. This has increased from 600,000 feet a year due to more personnel and equipment (City of Hayward, 2016). The City of Livermore has conducted approximately 3,000 feet of CCTV inspection a day or approximately 1.1 million feet per year. The City of San Leandro conducts pipe inspections approximately every seven years (City of San Leandro, 2017). OLSB, CVSD, and USD also have aggressive inspection programs, covering one-fifth of their systems annually; OLSB is more aggressive by inspecting its entire system every 2.5 years. Alameda, Berkeley, Oakland, and Piedmont reported CCTV inspection of less than seven percent of their systems annually. Pleasanton inspects only new lines and problem areas with CCTV.

5.5 - Financing Constraints and Opportunities

Service-related financing constraints and opportunities are discussed in this section. The scope includes revenue sources, financing constraints, rates, and connection fees. The section identifies financing, rate restructuring, and cost-avoidance opportunities.

5.5.1 - FINANCING RESOURCES

Sewer service charges, connection fees, property tax, assessments, and voter-approved measures are significant revenue sources for wastewater enterprises in Alameda County. There is a basic difference in how single service and multiservice agencies collect funds for wastewater enterprises. It appears that multiservice agencies can split overhead costs within their rates of multiple municipal services in order to provide lower overall costs for wastewater services, whereas single service agencies must include all overhead within the rate for wastewater service. Chart 5-1 shows the typical wastewater agency revenue sources. Table 5-8 breaks down the revenues of each agency.

Almost 80 percent of all revenues for these agencies comes from sewer collection fees. The availability of service and accompanying capacity furthers the importance of ensuring infrastructure is available and services accordingly in order to keep rates at a reasonable level for customers.

Chart 5-1
Wastewater Agency Revenue Sources (2018)

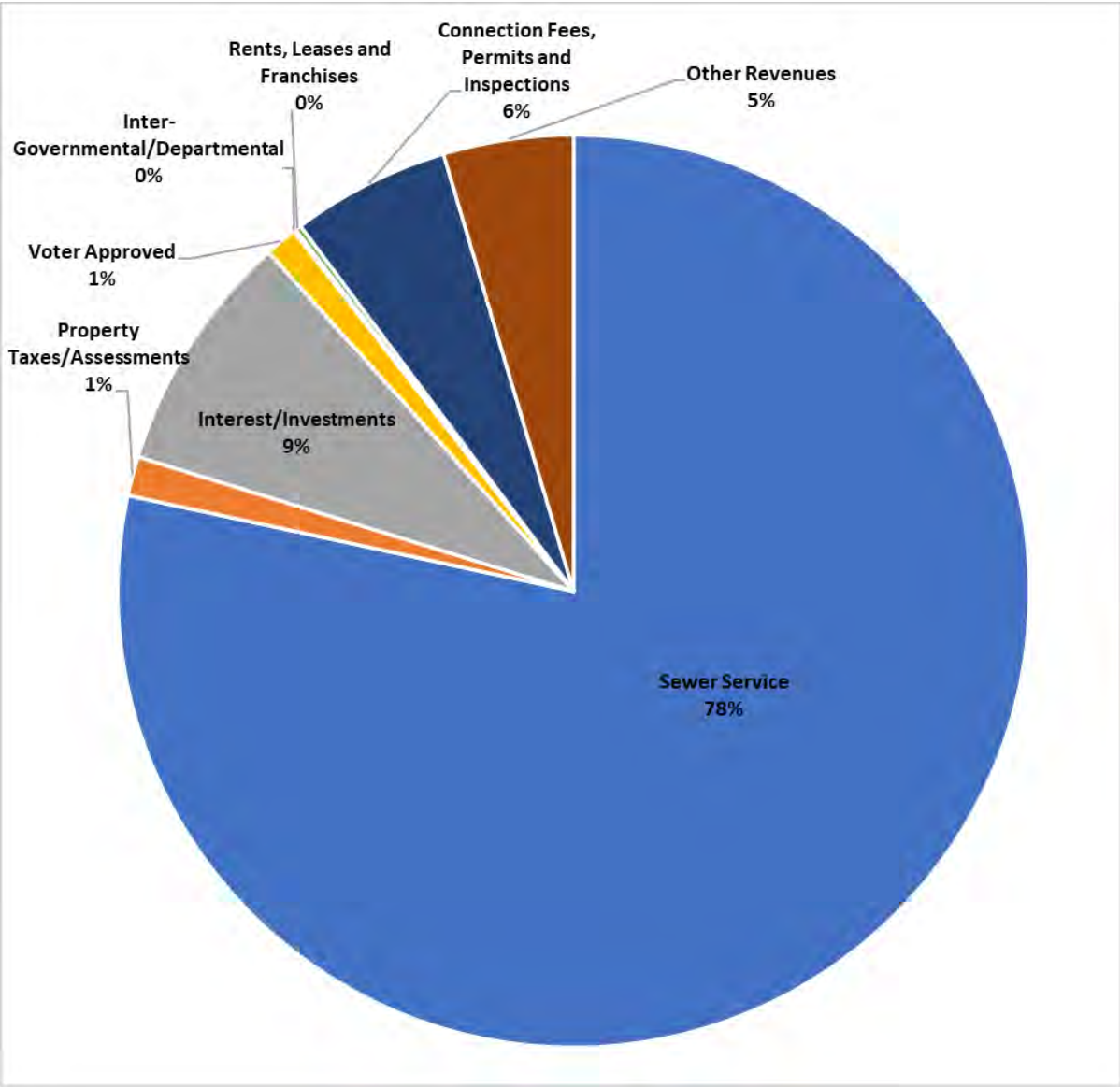


Table 5-8
Wastewater Agency Revenues (2018)

Wastewater Agency	Sewer Service	Property Taxes & Assessments	Interest/ Investments	Voter Approved	Inter-Governmental Departmental	Rents, Leases and Franchises	Connection Fees, Permits and Inspections	Other Revenues	Total
Castro Valley SD	\$9,198,341 88%	\$881,919 8%	\$164,483 2%	\$0 0%	\$0 0%	\$0 0%	\$36,933 <1%	\$156,358 2%	\$10,438,034
DSRSD	\$23,478,551 53%	\$0 0%	\$434,722 1%	\$0 0%	\$0 0%	\$0 0%	\$18,731,114 42%	\$1,602,902 4%	\$44,247,289
EBMUD	\$74,357,000 53%	\$5,558,000 4%	\$35,646,000 25%	\$5,331,000 4%	\$276,000 <1%	\$922,000 1%	\$370,000 <1%	\$12,896,000 9.53%	\$135,356,000
Oro Loma SD	\$17,885,613 95%	\$54,403 <1%	\$300,325 2%	\$0 0%	\$79,371 <1%	\$92,795 <1%	\$280,541 2%	\$60,603 <1%	\$18,753,651
Union SD	\$54,260,096 96%	\$0 0%	\$700,856 1%	\$0 0%	\$0 0%	\$0 0%	\$1,631,870 3%	\$0 0%	\$56,592,822
Alameda	\$10,498,070 98%	\$0 0%	\$163,559 2%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$9,573 <1%	\$10,671,202
Albany	\$3,488,365 99%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$44,991 <1%	\$3,533,356
Berkeley	\$22,366,392 93%	\$0 0%	\$101,830 <1%	\$0 0%	\$0 0%	\$0 0%	\$1,613,395 7%	\$7,233 <1%	\$24,088,850
Emeryville	\$872,691 83%	\$0 0%	\$51,443 5%	\$0 0%	\$0 0%	\$0 0%	\$123,828 12%	\$0 0%	\$1,047,962
Hayward	\$22,713,990 84%	\$0 0%	\$388,097 1%	\$0 0%	\$12,131 <1%	\$0 0%	\$3,179,420 12%	\$605,043 2%	\$26,898,681
Livermore	\$21,341,703 96%	\$0 0%	\$725,351 3%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$50,055 <1%	\$22,117,109
Oakland	\$65,589,000 99%	\$0 0%	\$730,000 1%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$25,000 <1%	\$66,344,000
Piedmont	\$2,491,116 ²⁹ 99%	\$0 0%	\$7,161 <1%	\$0 0%	\$0 0%	\$0 0%	\$1,145 <1%	\$0 0%	\$2,499,422
Pleasanton	\$14,524,903 94%	\$0 0%	\$154,223 1%	\$0 0%	\$0 0%	\$0 0%	\$110,449 1%	\$705,375 5%	\$15,494,950
San Leandro	\$11,890,380 93%	\$0 0%	\$260,364 2%	\$0 0%	\$0 0%	\$0 0%	\$104,523 1%	\$579,820 5%	\$12,835,087
TOTAL	\$358,444,281	\$6,494,322	\$39,828,414	\$5,331,000	\$367,502	\$1,014,795	\$26,183,218	\$21,491,953	\$455,667,415
%	78%	1%	9%	1%	<1%	<1%	6%	5%	

²⁹ Piedmont's revenue collected via a special parcel tax approved by voters in 2000. The City Council sets the tax rate each year during the budget process.

Property taxes and assessments comprise only about one percent of total revenues. Property taxes are subject to State constitutional limits established under Proposition 13. Furthermore, these revenues fluctuate with market conditions and do not recover at the same rate which they decline due to Proposition 13. Property assessments are much more stable as they are not subject to property valuation changes. Generally, they are established through the Proposition 218 process and accompanied by some sort of engineering study, which establishes an assessment for a specific purpose to be levied to property owners. That assessment could be adjusted annually with inflation if it was part of the original ballot effort to the property owners, which makes a more reliable revenue source at times than property tax. However, no agency relies more than nine percent on these sources.

Return on investments is a relatively simple way for agencies to accumulate additional revenue from the revenues or reserves which they have accumulated. However, this amount is considerably more than water enterprises as it comprises almost nine percent of total revenues.

Agencies may have specific needs that have been identified or discussed with their customers and residents. These items may be supported with revenues established through a voter initiative, such as a proposition. In many instances, these revenues can match or exceed revenues collected from property taxes or assessments due to the revenues being identified for a specific use, such as improvements or the purchase of water resources.

An interdepartmental or governmental transfer is a minor revenue source for these agencies that involve items such as credits for homeowners living within the district or transfer of money from one department of the agency to the wastewater enterprise. Some of these districts have many other revenue sources, which they could essentially loan the wastewater enterprise if needed. However, only 0.08 percent of revenues for these agencies is generated in this fashion, and there are a lot of restrictions involved.

Franchise, rent, and lease agreements may generate revenues for these agencies but only generates 0.2 percent of overall revenues. Of all the agencies, only EBMUD utilizes franchise agreements to generate considerable revenues in the amount of approximately \$1 million. This far and away exceeds all other agencies' use of these agreements for revenue purposes.

Lastly, all other revenue sources only comprise five percent of overall revenues. The fact that these sources are not heavily relied upon is important because it is likely that many revenue sources that are categorized as others may be one-time type sources and may not be available in future budgetary years.

5.5.2 - FINANCING CONSTRAINTS

Wastewater providers must maintain an enterprise fund for the water utility separate from other funds and may not use wastewater utility revenues to finance unrelated governmental activities. Local agencies providing wastewater services are required to

maintain separate enterprise funds to ensure that wastewater-related finances are not commingled with the finances of other enterprises, such as water. Furthermore, cities providing wastewater service must account for wastewater enterprise finances separately from their general funds. Cities may not use the wastewater enterprise fund to finance general fund activities. Conversely, it is not illegal for a city to use general funds to support the wastewater enterprise but is generally not favorable as it shows that the enterprise is not solvent and cannot support itself based on its current rate and operations structure.

The boards of each of the public sector wastewater providers are responsible for establishing service charges. Service charges are restricted to the amount needed to recover the costs of providing wastewater service. The wastewater rates and rate structures are not subject to regulation by other agencies. The agencies can and often do increase rates annually. Some agencies have had voter approval for additional revenues to support the districts' wastewater enterprise, which typically comprises a small portion of the overall revenue funding and is typically restricted to a specific set of uses, such as additional infrastructure deficiencies or equipment purchases.

The primary financing restrictions of public agencies are the limitations associated with rate increases and compliance with Proposition 218. Proposition 218 is a costly and involved process that requires justification for increases associated with operating the enterprise. Voter support for any increase in financial obligations, such as fees or rates, can waiver based on events outside the control of the agency. Providing informative outreach and education is increasingly important to the viability of any increase in financial revenues under Proposition 218.

Similarly, connection fees for wastewater providers are established by each respective board to recover the costs of extending infrastructure and capacity to new development. The fees must be reasonable and may not be used to subsidize operating costs.

Propositions 13, 218, 26, and the Mitigation Fee Act are State constitutional and statutory provisions that establish various limits to how revenue can be generated by local agencies. A more detailed description of how these propositions constrain public agency revenues can be found in Section 4.5.2 of this MSR.

5.5.3 - FINANCING OPPORTUNITIES

There are two basic types of financing opportunities available to agencies. The first being one-time funds, such as grants, that may be used for a strategic need or project that helps to reduce the financial burden on ratepayers within the limits of the agency. These funds are usually competitive and require forward design and planning to be presented for funding from the grant or bond. The second type of funding is ongoing financial resources, such as taxes and rates. These funds are available annually through agency collection activities and are adopted through various methods, such as the annual budget or Proposition 218 process. These ongoing funding types are much more significant to the financial health of an agency.

The State Water Resources Control Board offers a low interest loan program, which the City of Piedmont has utilized to finance several phases of the sanitary sewer rehabilitation project.

Issuance of Bonds

Agencies may issue bonds to aid with funding infrastructure and improvements. However, the issuance of bonds requires sound budgeting as they become a debt service to the agency for a period of time, typically 20 to 30 years. That debt service must be paid back by the agency in order to maintain a decent credit rating. A decline in credit rating limits the agencies' ability to earn other financial loans or issuance of bonds in the future. The agency may pay off bonds early if resources are available. Agencies may also include bond payments within the rate structure to aid in the payback as well, but these increases typically require approval by customers in accordance with Proposition 218.

Increase Rates, Fees, and Special Taxes in accordance with Proposition 218

On November 5, 1996, the California electorate approved Proposition 218, the self-titled "Right to Vote on Taxes Act." Proposition 218 adds articles XIIC and XIID to the California Constitution and makes numerous changes to local government finance law. Proposition 218 was approved by a 56.6 percent to 43.4 percent vote. It requires voter approval for increases in any property owner taxes, assessments, or fees. The hurdle of obtaining a majority approval, and in some cases a two-thirds majority, by the electorate, has often limited the ability of agencies to increase revenues. In some cases, critical and unique issues do not require significant outreach to educate the electorate as it has already been publicized or create a critical issue that residents want to resolve. In other cases, residents may review an increase in assessments or other charges as overreaching. Convincing customers and voters are an issue that all agencies must consider when attempting to increase revenues subject to Proposition 218 through the electorate.

5.5.4 - RATES

All agencies have adopted rates or taxes that fund operations, maintenance, and administrative activities. These rates are adopted by following the substantive and procedural requirements of Prop 218. The rates are accompanied by the outlay of agency activities, purchases and infrastructure needs, and expansion that in turn are passed to customers for funding for the most part. Rates are usually divided between multiple customer categories, such as residential, commercial, industrial, non-potable, or recycled.

Rate Factors

Wastewater rates are derived through an engineering report that is adopted by each agency that reviews overall operating and maintenance costs throughout the system. Specific improvements and replacement of existing facilities may be placed within the overall rate depending on the benefit to the customer base, or it may be more centralized within a service zone to the specific neighborhood that improvement may benefit, which

could lead to different rates throughout the over agency boundaries. In many cases, the agency may only charge a rate charge for maintenance and operation of conveyance infrastructure, and then another agency charges for treatment.

The overall rate should also include the cost for electricity in addition to the cost to collect, distribute, and treat the wastewater of the agency. If costs go up from another provider to the agency, such as the treatment plant operator, that cost must be borne through the rates for the agency to remain solvent financially and continue to operate. For example, many of the cities operate conveyance infrastructure by distributing effluent to EBMUD, who will need to pass costs of operating and maintaining the treatment plant to its customer agencies. An agency typically does not subsidize costs to customers without some basis for doing so, such as having a budget surplus in a given year.

Chart 5-2 shows each agency's residential rates. The estimated rates shown were taken from agency websites in 2019 and adjusted for comparison purposes. The average rate of the service providers is about \$36.64 for single-family residential use. Most agencies are near or below the average rate within the region. Most of the rates are flat in nature and do not fluctuate based on more usage by the user. However, Berkeley's rate is based on usage, and is likely less than what is shown for most customers. Berkeley charges by the water unit, with a bi-monthly billing cap that is the equivalent of the amount shown. The typical average is not known.³⁰

Some of these rates only include conveyance, and customers received a second bill from the regional wastewater provider. For example, Emeryville does not do treatment, and customers receive bills from the City and their provider, EBMUD.

Commercial and industrial rates vary by the type of business or operation, which dictates the type of treatment ultimately needed and provided to the customer. As uses intensify in the wastewater generated, costs increase as more impacts are made to the conveyance systems and/or more treatment is required.

As shown in Chart 5-3, the average commercial or industrial rate of the service providers is about \$194.05 based on usage of 50 ccf of water. The estimated rates shown were taken from agency websites in 2019 and adjusted for comparison purposes. There appears to be a wide range of charges, with few agencies being near or below the average rate within the region, while three agencies, DSRSD and the cities of Hayward and Berkeley, are upwards of \$300 per month. With every agency, there are varying categories of non-residential uses that are charged at rates specialized for the individual system to which they are connected. Some agencies have very sophisticated categories for charging for discharge and treatment, as each use may use more water and create different products that require specialized treatment.

³⁰ Berkeley's sewer rates are collected through the water service bills issued by the East Bay Municipal Utility District.

**Chart 5-2
Estimated Monthly Residential Wastewater Rates**



Note: Berkeley’s rate is likely less than what is shown for most customers. Berkeley charges by the water unit, with a bi-monthly billing cap that is the equivalent of the amount shown. The typical average is not known.

**Chart 5-3
Estimated Monthly Non-Residential Wastewater Rates**



Some agencies include industrial uses within their non-residential rates. Others classify industrial wastewater separately because of the significant treatment requirements they create. The biosolids created by some industrial uses cannot be conveyed through the local system and must be deposited at the local regional treatment plant. At that time, the weight of the solids determines the cost for treatment by the customer. Such examples of onsite delivery of solids include food processing plants, manufacturing plants, and wineries. More specifically, wineries throughout the region may deliver their wastewater to plants within Alameda County due to the lack of facilities within their region.

Special Rates

The operators of wastewater treatment or water reclamation plants each offer rates for separate and/or individual users who haul wastewater and other organic wastes, which can be treated at their plants. Accordingly, the costs for these services are broken into three basic categories: biochemical organic disposal, total suspended solids, and total volume metric flow rate (per 100 cubic feet). Furthermore, providers further classify the wastewater based on user type, as many require special treatment and additional disposal operations in order to properly treat different waste types. As stated previously, these functions include treatment of industrial waste products as well as treatment of agriculture sludge and wastewater from operations, such as wineries throughout the region. These costs have been studied and adjusted accordingly to capture proper storage and treatment costs and operational/maintenance expenditures for each regional facility operated by local providers. Of all the agencies, EBMUD maintains the most robust list of specialized fees and rates to accommodate the varying types of wastewater treatment classified by use. The other treatment agencies should look into possibly having more specialized rate schedules in order to ensure that all uses are being charged proportionally with the actual costs of treatment. Depending on the service provider, there are rates that are included in their service charges related to the characteristics of the environment, such as added pumping due to elevation or additional treatment requirements, or of their infrastructure, such as age and frequency of maintenance.

Reserve Funds

Reserve funding is established by each agency through the adoption of budgetary policy. So, these amounts vary from agency to agency and may be utilized for different purposes. However, in most cases, the budget reserve has specific criteria as to how much is collected (total dollar amount or percent of revenue, generally) and included in the overall rate structure to be collected. If any agency had a reserve fund that allowed for operations of between six months to a year, that is adequate and a best management practice in order to allow for the continued operation of the agency even in downturns and unfavorable conditions. Table 5-9 shows each agency's reserve balance.

Table 5-9
Reserve Balance of Special District Wastewater Agencies FY 18-19³¹

Wastewater Agency	Reserve Balance	Projected Expenditures	Percentage of Expenditures
Castro Valley SD	\$19,013,984	\$13,692,392	138.9%
DSRSD	\$28,797,510	\$47,273,849	60.9%
EBMUD	\$78,000,000	\$144,600,000	53.9%
Oro Loma SD	\$9,451,500	\$21,374,700	44.2%
Union SD	\$58,287,453	\$75,454,213	77.2%
Alameda	\$27,900,000	\$100,600,000	27.7%
Albany	\$10,782,942	\$9,340,386	115.4%
Berkeley ³²	\$26,385,600	\$191,200,000	13.8%
Emeryville	\$38,634,827	\$81,725,596	47.3%
Hayward	\$26,671,000	\$162,790,000	16.4%
Livermore	\$52,700,000	109,666,192	48.1%
Oakland	\$52,273,623	\$655,127,232	8.0%
Piedmont	\$4,890,000	\$27,367,000	17.9%
Pleasanton	\$22,074,847	\$172,100,000	12.8%
San Leandro	\$53,300,000	\$116,790,000	45.6%

Some agencies have multiple enterprise funds with multiple reserves for the associated services, such as rate stabilization or capital improvements. For example, the cities which also provide wastewater services have general fund revenues and reserves, which can be used at the discretion of the governing body to allocate to services as needed. However, it is not recommended that general fund monies or reserves be used to supplement enterprise funds, as enterprise funds and the associated rates should be designed to operate independently without aid from outside sources.

Some cities' outlook going forward would be that reserve could be depleted within as few as two budget cycles. However, it was not identified that enterprise funds for wastewater services would be running at a deficit as the agencies update rates annually to ensure solvent operations. The deficit issues could potentially impact other services associated with general fund revenues.

Clean Water State Revolving Fund (CWSRF)

The CWSRF was created by the 1987 amendments to the Clean Water Act (CWA) as a financial assistance program for a wide range of water infrastructure projects, under 33 U.S. Code §1383. The program is a partnership between EPA and states that replaced EPA's

³¹ If a reserve amount was not listed in the Fiscal Year 18-19 budget, beginning fund balance was used to demonstrate available cash on hand for the agency.

³² No budget figure for reserve was available for the City of Berkeley. The City adopted a reserve policy with the goal of the first year being 13.8 percent. This figure was used for comparison purposes and verification of the actual amount may be done with the City.

construction grants program. States have the flexibility to fund a range of projects that address their highest priority water quality needs. The program was amended in 2014 by the Water Resources Reform and Development Act.

Using a combination of federal and State funds, State CWSRF programs provide loans to eligible recipients to:

- Construct municipal wastewater facilities.
- Control nonpoint sources of pollution.
- Build decentralized wastewater treatment systems.
- Create green infrastructure projects.
- Protect estuaries.
- Fund other water quality projects.

Building on a federal investment of \$45.2 billion, the State CWSRFs have provided \$138 billion to communities through 2019. States have provided 41,234 low-interest loans to protect public health, protect valuable aquatic resources, and meet environmental standards benefiting hundreds of millions of people (Environmental Protection Agency, 2020). The funding pays for the repair of existing infrastructure, not new growth.

5.5.5 - RESTRUCTURING OPPORTUNITIES

For the most part, the wastewater service providers have remained consistent with keeping up with inflation and updating rates as needed to prevent any sort of deficit or gap in service funding for customers. All agencies charge rates that are based on wastewater generated by different individual uses.

Furthermore, agencies have adopted additional rates to accommodate the needs of wastewater disposal activities that are not directly related to sewer operations. The addition of these ancillary uses provides benefits to other communities that may not be able to finance or provide such services. These agencies conversely charge appropriate fees for these supplementary services, such as industrial or agricultural wastewater and organics disposal. Rate structures are shown in Table 5-10.

Adjustments for inflation or other service-related increases should be noted in any rate study conducted by wastewater agencies. The City of Livermore shows a 10-year rate structure with an anticipated increase by individual categories. This process appears to be the most detailed budgeting of wastewater rate development of any of the wastewater agencies as it provides insight into anticipated increases by the agency, allowing maximum collections if needed but can be adjusted down if the increases do not materialize. Alternatively, Berkeley had to implement significant increases to their rates, averaging 14.7 percent annually over five years. Such increases may not be viable politically with residents at times due to the large jump in cost.

**Table 5-10
Agency Rate Structures**

Water Agency	Residential Flat or Usage Based	Non-Residential Flat or Usage Based	Adjusted for Inflation	Last Updated
Castro Valley SD	Flat	Flat	5% Annually	2019
DSRSD	Flat	Usage	2.5%	2017
EBMUD	Usage	Usage	4.4%	2017
Oro Loma SD	Flat	Usage	7.5%	2016
Union SD	Flat	Usage	7.8%	2020
Alameda	Flat	Flat	3.0%	2020
Albany	Flat	Flat	2.5%	2019
Berkeley	Usage	Usage	14.7%	2015
Emeryville	Flat	Usage	9.0%	2016
Hayward	Tiered ³³	Usage	3.0%	2017
Livermore	Flat	Usage	9.0%	2017
Oakland	Flat	Usage	CPI	2017
Piedmont	Flat Tax	Flat Tax	Set by Council	2021
Pleasanton	Flat	Usage	2.5%	2015
San Leandro	Flat	Usage	Cost of Living Index	2019

5.5.6 - COST AVOIDANCE OPPORTUNITIES

Opportunities for cost avoidance are dependent on each agencies' willingness to communicate and share information with other wastewater agencies. Within Alameda County, the agencies do conduct significant coordination with partner agencies, as some cities only provide conveyance infrastructure to regional treatment facilities maintained by other agencies. Therefore, significant coordination for capacity agreements and understanding of operations appears to be evident.

As each agency maintains and operates its own conveyance infrastructure, it makes it more difficult to collaborate on funding and joint projects as partner agencies may not have other infrastructure within the right of way that needs to be maintained. Treatment plant operating agencies should coordinate with their partner cities' public works departments in order to prevent roadways and other rights of way from being excavated multiples times to maintain conveyance infrastructure.

Cities that operate and maintain both conveyance and treatment infrastructure are more able to plan corresponding improvements easily during their budget and CIP adoption processes. These agencies should plan their CIP to mirror improvements within similar areas of the city to prevent overruns and duplicate mobilization of crews to the same segments of right of way that house multiple infrastructure lines.

³³ Hayward has tiered rates for residential use.

5.6 - Evaluation of Management Efficiencies

This section provides an evaluation of management efficiencies at the wastewater agencies. This section considers the effectiveness of each agency in providing efficient, quality public services. Efficiently managed agencies are deemed those that consistently implement plans to improve service delivery, reduce waste, eliminate duplications of effort, contain costs, maintain qualified employees, and build and maintain adequate contingency reserves.

There are various management practices used by wastewater service providers in Alameda County, which include implementing benchmarking and monitoring performance to improve service delivery, planning efforts, and emergency planning. Wastewater planning among significant wastewater service providers in the County is presented in Table 5-11.

Alameda

For the sewer system, the City of Alameda uses the EBMUD oil and grease best management practices. Additionally, the annual budget includes performance indicators of replacement of three miles per year. Other performance measures appear to include some benchmarking during the Sewer Master Plan development to establish baseline conditions and capacity assessment to determine the overall CIP for the life of the plan (City of Alameda, 2017).

Alameda conducts capital improvement planning over a 10-year planning horizon but is updated during the budgeting cycle.

Albany

For the sewer system, the City of Albany uses the following indicators to monitor performance integrity (City of Albany Public Works Department, 2014):

- Sanitary Sewer Overflow (SSO) Sewer Main Rate (SSOs/100 miles/year).
- Number of lower lateral overflows.
- Number of SSOs for each cause (roots, grease, debris, pipe failure, capacity, lift station failures, and other).
- Median SSO volume (gallons).
- Percentage of SSOs greater than 100 gallons.
- Percentage of sewage contained compared to total volume spilled.
- Percentage of total spilled sewage discharged to surface water.

The City's Sanitary Sewer Management Plan serves as its wastewater strategic planning document. The management plan was adopted in 2014 and has a planning horizon of 10 years. Albany conducts capital improvement planning over a three-year planning horizon but is updated during the budgeting cycle.

**Table 5-11
Wastewater Planning**

Service Provider	Wastewater Master Plan		Capital Improvement Plan		Emergency Response Plan	Other Plans
	Date/Version	Planning Horizon	Date/Version	Planning Horizon		
Alameda	2015	20 years	FY 2019-2020	10 years	Overflow Emergency Response Plan	None identified
Albany	2014	10 years	FY 2017-2018	5 years	Basic Emergency Operations Plan (EOP)	None identified
Berkeley	2019	20 years	Annually	5 years	2016 Emergency Operations Plan	Conditions Assessment Plan (CCTV)
Dublin	See DSRSD	n/a	FY 2018-2019	5 years	Tri-Valley Hazard Mitigation Plan	None identified
Fremont	See USD	n/a	FY 2017-2018	5 years	Safety Element of General Plan	None identified
Emeryville	2019	20 years	FY 2019-2020	5 Years	Local Hazard Mitigation Plan	Sanitary Sewer Management Plan
Hayward	2015	10 years	FY 2019-2020	10 Years	n/a	Hayward Water Pollution Control Facility Master Plan, Sewer System Management Plan
Livermore	2017	20 years	FY 2019-2021	20 years	Livermore-Pleasanton Emergency Operations Plan, Tri-Valley Local Hazard Mitigation Plan	Sewer System Management Plan, Wastewater Asset Plan
Newark	See USD	10 years	FY 2018-2020	3 years	Union City/Newark Multi-Jurisdiction Hazard Mitigation Plan	None identified
Oakland	2014	10 years	FY 2019-2020	2 years	n/a	None identified
Piedmont	n/a	n/a	FY 2019-2020	1 year	Get Ready, Piedmont Disaster Preparedness Manual	Sewer System Management Plan

Service Provider	Wastewater Master Plan		Capital Improvement Plan		Emergency Response Plan	Other Plans
	Date/Version	Planning Horizon	Date/Version	Planning Horizon		
Pleasanton	2007	15 years	FY 2019-2020	10 years	Livermore-Pleasanton Emergency Operations Plan, Tri-Valley Local Hazard Mitigation Plan	Sewer System Management Plan
San Leandro	n/a	n/a	FY 2020-2021	2 years	Local Hazard Mitigation Plan	Sewer System Management Plan
Union City	See USD	n/a	FY 2019-2020	5 years	n/a	None identified
Castlewood CSA	n/a	n/a	FY 2016-2017	1 year	n/a	None identified
CVSD	2018	10 years	FY 2018-2020	10 years	n/a	2019-2024 Strategic Plan
DSRSD	2017	15 years	FY 2020-2021	10 years	Tri-Valley Hazard Mitigation Plan	Wastewater Treatment and Biosolids Facilities Master Plan, Wastewater Collection System Master Plan, DSRSD Strategic Plan, Odor Control Study, Emergency Response Plan
EBMUD	2011	30 years	FY 2018-2019	2 years	Public Safety Power Shutoff	Sewer System Management Plan, Interceptor Master Plan, Bio Solids Master Plan, Odor Control Master Plan, Pump Station Master Plan, Energy System Master Plan
OLSD	2003	20 years	FY 2019-2020	10 years	n/a	Sanitary Sewer Management Plan
USD	Multiple	n/a	FY 2019-2020	1 year	n/a	Alvarado Basin Sewer Master Plan, Newark Basin Sewer Master Plan, Irvington Sewer Master Plan

Berkeley

For the sewer system, the City of Berkeley uses the following indicators to monitor and continually evaluate system integrity (City of Berkeley, 2019).

- System Statistics:
 - Total miles of gravity sewer.
 - Total miles of pressure sewer.
 - Total number of manholes.
 - Total number of sewage pumping stations.
- Measures Based on SSO Number:
 - Total number and percentage of SSOs by category.
 - Number and percentage of dry weather versus wet weather SSOs.
 - Number of SSOs by cause.
 - Number of SSOs per 100 miles of sewer per year.
 - Number of locations with repeat SSOs.
 - Number of locations where SSOs occurred in pipes previously rehabilitated.
- Measures on SSO Volume:
 - Volume of SSOs per 100 miles per year.
 - Number and percentage of SSOs by volume.
 - Total volume of SSOs.
 - Mean and median SSO volume.
 - Total SSO volume recovered and percentage of overall total SSO volume.
 - Net volume of SSOs (total minus recovered) and percentage of overall total SSO volume.
 - Total volume reaching storm drainage channel and not recovered or reaching surface waters and percentage of overall total SSO volume.
- SSO Response Time:
 - Average response time during business hours.
 - Average response time outside of business hours.
- Maintenance:
 - Number of blockages in the past year by cause.
 - Amount of “hot spot” cleaning performed (LF).
 - Amount of routine cleaning performed (LF).
 - Amount of cleaning QA/QC CCTV performed (percent of cleaning footage).
 - Amount of root control performed (LF).
- Condition Assessment, Rehabilitation and I/I Control:
 - Amount of CCTV inspection performed (LF).
 - Number of manholes inspected.
 - Amount of mainlines (LF) and number of manholes and lower laterals rehabilitated.
 - Number of inflow sources detected and corrected.
 - Number of PSLs repaired or replaced and certified.

The City's Sanitary Sewer Management Plan serves as its wastewater strategic planning document. The management plan was adopted in 2019 and has a planning horizon of five years. Berkeley conducts capital improvement planning over a five-year planning horizon but is updated annually during the budgeting cycle.

Dublin

The City of Dublin's sewer system is predominantly managed by the DSRSD. All management practices are included in the discussion regarding DSRSD. Dublin conducts capital improvement planning over a five-year planning horizon but is updated annually during the budgeting cycle.

Emeryville

The City of Emeryville's sewer system utilizes the regional standards developed by EBMUD. These management practices are included in the discussion regarding EMBUD. Emeryville conducts capital improvement planning over a five-year planning horizon but is updated annually during the budgeting cycle.

Fremont

The City of Fremont's sewer system is predominantly managed by the USD. All management practices are included in the discussion regarding USD. Fremont conducts capital improvement planning over a five-year planning horizon but is updated annually during the budgeting cycle.

Hayward

The City of Hayward's sewer system uses the goals of the Sanitary Sewer Management Plan to drive performance and evaluation indicators. The goals are as follows (City of Hayward, 2016):

- To protect public health and the environment through proper management of the public wastewater collection system.
- To professionally manage, operate, and maintain all parts of the public wastewater collection system.
- To implement measures to minimize the frequency of sanitary sewer overflows.
- To provide adequate capacity to convey peak flows.
- To respond to and mitigate the impacts of sewer system overflows.
- To provide an effective and efficient guidance document for responding to and managing sewer collection system emergencies.

These goals review periodic audits, which also review the need to update or revise operations and maintenance activities, design and performance provisions, Overflow Emergency Response Plan, capacity assurance, and other indicators (City of Hayward, 2017). The City's Sewer System Management Plan serves as its wastewater strategic planning

document. Hayward conducts capital improvement planning over a 10-year planning horizon but is updated annually during the budgeting cycle.

Livermore

For the sewer system, the City of Livermore uses the following indicators to monitor and continually evaluate system integrity (City of Livermore, 2019):

- Total number of SSOs.
- Location of all SSOs over the past five years (60 months).
- SSO Rate – SSO's per 100 miles of sanitary sewer.
- Miles of gravity mainlines cleaned – monthly/annually.
- Miles of gravity mainlines CCTV inspected – monthly/annually.
- Service response calls – annually.
- Lower lateral inspections – monthly/annually.
- Most worked on assets.

The City's Sewer System Master Plan (2017) serves as its wastewater strategic planning document. Livermore conducts capital improvement planning over a 20-year planning horizon but is updated bi-annually during the budgeting cycle.

Newark

The City of Newark's sewer system is predominantly managed by the USD. All management practices are included in the discussion regarding USD.

Newark conducts capital improvement planning over a three-year planning horizon but is updated bi-annually during the budgeting cycle.

Oakland

For the sewer system, the City of Oakland uses the following indicators to monitor performance integrity (Carollo, 2014):

- Minimize the frequency and impact of SSOs by:
 - Cleaning all sewer mains by June 30, 2018.
 - Treating 50 miles of sewers per year to control root growth.
 - Cleaning "hot spots" annually or more frequently if required.
 - Repairing acute defects in the sewer collection system within 12 months of identification.
 - Monitoring water levels at 12 locations for capacity assurance.
 - Completing improvements to pump stations by October 15, 2022.
- Reduce infiltration and inflow (I/I) by:
 - Rehabilitating 63,360 linear feet (12 miles) of sewer mains per year in specified subbasins.

- Rehabilitating an additional 5,280 linear feet (one mile) of sewer mains per year anywhere in the City.
- Inspecting and documenting condition assessment of sewer mains at an annual rate of no less than 10 percent per year.
- Working with EBMUD to reduce I/I in private sewer laterals.
- Inspecting and repairing or rehabilitating, as necessary, all sewer laterals owned by the City in specified subbasins.
- Taking steps to eliminate high priority sources of inflow and rapid infiltration identified through EBMUD's Regional Technical Support Plan.
- Performing other work required by the consent decree.

The City's Asset Management, Implementation Plan, and Sanitary Sewer Management Plan serve as its wastewater strategic planning document. Oakland conducts capital improvement planning over a two-year planning horizon, updated annually during the budgeting cycle.

Piedmont

The City of Piedmont utilizes its Sewer System Management Plan and Asset Management Implementation Plan as its planning documents. Sewer funding and expenditure projections are included in the City's annual budget. The City Engineer and Public Works Director plan rehabilitation projects many years out based upon industry standards and inspection data.

Pleasanton

For the sewer system, the City of Pleasanton uses the following indicators to monitor performance integrity (City of Pleasanton, 2018):

- Total number of SSOs.
- Number of SSOs by cause (roots, grease, debris, pipe or pump station failure, and other).
- Volume of sewage spilled, recovered, and reaching water(s) of the State.

The City's Sewer System Management Plan serves as its wastewater strategic planning document. The management plan was adopted in 2007 and has a planning horizon of 15 years. Pleasanton conducts capital improvement planning over a 10-year planning horizon but is updated annually during the budgeting cycle.

San Leandro

San Leandro conducts capital improvement planning over a ten-year planning horizon with updates biannually during the budgeting cycle.

Union City

Union City's sewer system is predominantly managed by the USD. All management practices are included in the discussion regarding USD. Union City conducts capital improvement

planning over a five-year planning horizon but is updated annually during the budgeting cycle.

Castlewood CSA

Castlewood CSA does not appear to have a Wastewater Master Plan document and appears to manage the conveyance system on a year-to-year basis through the CIP. Castlewood CSA conducts capital improvement planning over a one-year planning horizon but is updated annually during the budgeting cycle.

Castro Valley Sanitary District

For the sewer system, the CVSD uses the following indicators to monitor performance integrity (Castro Valley Sanitary District, 2018):

- General records documenting compliance with all provisions of the SSS WDRs and this MRP.
- SSO events including, but not limited to:
 - Complaint records documenting how CVSD responded to all notifications of possible or actual SSOs, both during and after business hours, including complaints that do not result in SSOs. Each complaint record shall, at a minimum, include the following information:
 - Date, time, and method of notification.
 - Date and time the complainant or informant first noticed the SSO.
 - Narrative description of the complaint, including any information the caller can provide regarding whether or not the complainant or informant reporting the potential SSO knows if the SSO has reached surface waters, drainage channels, or storm drains.
 - Follow-up return contact information for complainant or informant for each complaint received, if not reported anonymously.
 - Final resolution of the complaint.
 - Records documenting steps and/or remedial actions undertaken by CVSD, using all available information, to comply with Section D.7 of the SSS WDRs.
 - Documentation of all volume estimations made for discharges and, if applicable, discharge recoveries.
- Records documenting all changes made to the SSMP since its last certification indicating when a subsection(s) of the SSMP was changed and/or updated and who authorized the change or update. These records shall be attached to the SSMP as Appendix R.
- Electronic monitoring records relied upon for documenting SSO events and/or estimating the SSO volume discharged including, but not limited to, records from:
 - Supervisory Control and Data Acquisition (SCADA) systems.
 - Alarm system(s).
 - Flow monitoring device(s) or other instrument(s) used to estimate wastewater levels, flow rates, and/or volumes.

CVSD's Sewer System Management Plan serves as its wastewater strategic planning document. The management plan was adopted in 2018 and has a planning horizon of 10 years. CVSD conducts capital improvement planning over a 10-year planning horizon but is updated annually during the budgeting cycle.

Dublin San Ramon Sanitary District

DSRSD's Sewer System Management Plan serves as its wastewater strategic planning document. The management plan was adopted in 2019 and has a planning horizon of 15 years. DSRSD conducts capital improvement planning over a 10-year planning horizon but is updated annually during the budgeting cycle.

East Bay Municipal Utility District

For the sewer system, the EBMUD uses the following indicators to monitor performance integrity through annual audits that investigate the effectiveness of the SSMP and is ultimately reported in the annual summary report during budget adoption (East Bay Municipal Utility District, 2019).

EBMUD's Sewer System Master Plan serves as one of the multiple strategic planning documents. The management plan was updated in 2011 and has a planning horizon of 30 years. EBMUD conducts capital improvement planning over a two-year planning horizon but is updated annually during the budgeting cycle.

Oro Loma Sanitary District

For the sewer system, the OLSD uses the following suggested indicators to monitor performance integrity (Oro Loma Sanitary District, 2020):

- Inspect and grade all 270 miles of sewer pipe every 2.5 years.
- Clean and/or inspect 150,000 feet of sewer pipe each month.
- Continue the District's 15-year perfect compliance record with its National Pollution Discharge Elimination System (NPDES) Permit.
- Achieve 100 percent regulatory compliance with local, State, and federal requirements.
- Ensure that department expenses are managed within the limits of the adopted budget.
- Manage departmental expenses within budget.

OLSD's Sewer System Master Plan serves as its wastewater strategic planning document. The management plan was updated in 2003 and has a planning horizon of 20 years. OLSD conducts capital improvement planning over a 10-year planning horizon but is updated annually during the budgeting cycle.

Union Sanitary District

USD has multiple master planning documents for each individual basin served but not a single comprehensive system planning document. USD conducts capital improvement planning over a one-year planning horizon but is updated annually during the budgeting cycle. Performance indicators or other evaluation criteria were not readily apparent.

5.7 - Policy Analysis

All the wastewater service agencies practice proper dissemination of information by putting their budgets, agenda, and other general business documents on their websites. As previously stated, Castlewood CSA has limited information available directly under a page for itself, but pertinent information can be found in the Alameda County overall budget documentation pertaining to the agency. All agencies also make video broadcasts available either through web access or through local public television. Archives of past meetings are also available, which allow for accountability of past actions and clarification of issues discussed on the record for both constituents as well as the officials to review.

County voter turnout rate has been approximately 75 percent during the past three presidential elections and ranged from 22 to 66 percent for the past three non-presidential elections (Alameda County Elections Department, 2020). Most of the agencies maintain close to those ranges and promote voting during their election cycles for officers when warranted (see Table 5-12). Union Sanitary District appears to conduct individual ward elections in non-presidential years, which may contribute to a low voter turnout. Public accountability information for EBMUD, DSRSD, Hayward, Livermore, Pleasanton, and Castlewood CSA are already stated in the water services section.

5.8 - Determinations

- Wastewater collection service is available in most of the developed areas of the County through the municipal wastewater systems of the providers listed above (see Figure 5-1). Areas that do not have a municipal wastewater system, but may have wastewater services through a district, include Sunol, Hayward Marsh areas, Union City, ridge areas between and within Pleasanton and Hayward, canyons north of Castro Valley, and sparsely developed areas in eastern Alameda County.
- Five special districts provide services exclusive to utility services. Those services providers are Castro Valley Sanitary District, Dublin San Ramon Services District, East Bay Municipal Utility District, Oro Loma Sanitary District, and Union Sanitary District.
- There are 15 multipurpose agencies engaged in wastewater services in Alameda County. Three agencies provide wastewater collection and a portion of treatment services, while the other 12 agencies have contracted with a limited purpose agency to receive collection and/or treatment services.

**Table 5-12
Public Accountability**

	Alameda	Albany	Berkeley	Emeryville	Oakland	Piedmont	CVSD	OLSD	USD
Direct Service Provider	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Latest voter turnout	80%	83%	72%	79%	73%	87%	79%	71%	36%
Broadcast Meetings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Public comment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Discloses Finances	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Discloses Rates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Posts documents to website	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	Dublin	Fremont	Newark	San Leandro	Union City
Direct Service Provider	No	No	No	No	No
Latest voter turnout	80%	75%	75%	71%	72%
Broadcast Meetings	Yes	Yes	Yes	Yes	Yes
Public comment	Yes	Yes	Yes	Yes	Yes
Discloses Finances	Yes	Yes	Yes	Yes	Yes
Discloses Rates	Yes	Yes	Yes	Yes	Yes
Posts documents to website	Yes	Yes	Yes	Yes	Yes

- The cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont operate wastewater collection systems and rely on EBMUD for wastewater treatment and disposal. All of these cities' service areas are coterminous with their bounds, except Berkeley serves areas outside its bounds, as discussed below.
- Wastewater demand is primarily affected by population and economic growth, water use efficiency, infiltration and inflow, and loading factors. Many innovations have been made to reduce the rapid increase in wastewater demand. Water-efficient plumbing fixtures reduce the amount of wastewater. Low-flow toilets and washing machines can significantly reduce the demand for expanded wastewater services.
- Each wastewater treatment facility has adequate capacity to accommodate their average daily flow of influent with available capacity to accommodate near-term growth.
- Municipal wastewater providers practice extensive facility sharing. Examples include shared wastewater pipelines, shared treatment and reclamation facilities, and the DSRSD–EBMUD Recycled Water Authority (DERWA), a joint powers agreement established to a recycled water program to reduce the total amount of wastewater.
- To improve collection system integrity, all sewer service providers in Alameda County conduct some level of closed-circuit television (CCTV) inspection of sewer lines, although the rate of inspections varies by agency.
- Almost 80 percent of all revenues for these agencies comes from sewer collection fees. The average rate of the service providers is about \$36.64 for single-family residential use. Most of the rates or taxes are flat in nature and do not fluctuate based on more usage by the user. Some rates include both collection and treatment services, while some are charged for only one of these services.
- Commercial and industrial rates vary by the type of business or operation, which dictates the type of treatment ultimately needed and provided to the customer. As uses intensify in the wastewater generated, costs increase as more impacts are made to the conveyance systems and/or more treatment is required. The operators of wastewater treatment or water reclamation plants each offer rates for separate and/or individual users who haul wastewater and other organic wastes, which can be treated at their plants.
- Each sewer service provider has established a reserve fund to ensure solvency. Wastewater service providers have remained consistent with keeping up with inflation and updating rates as needed to prevent any sort of deficit or gap in service funding for customers. All agencies charge rates that are based on wastewater generated by different individual uses.

- All the wastewater service agencies practice proper dissemination of information by putting their budgets, agenda, and other general business documents on their websites.

SECTION 6 - FLOOD CONTROL SERVICES

6.1 - Service Overview

This section provides an overview of flood control services and providers in Alameda County and explains how the various flood control services are delivered and shared by the agencies.

The primary function of flood control is to manage the flow of flood waters and protect watercourses, watersheds, harbors, public highways, life, and property from damage or destruction from such waters. Flood control service activities include watershed planning, floodplain management, hazard mitigation, erosion control, building and maintaining infrastructures such as channels and pumps, as well as regular maintenance tasks that include desilting, dredging, fence repair, and debris and vegetation removal. Additional flood control activities include habitat restoration and public education.

6.1.1 - SERVICE PROVIDERS

The Alameda County Flood Control and Water Conservation District (ACFWCD) flood control system is an integrated part of local stormwater systems, which are built and managed by the cities, and functions as an extension of the local cities' stormwater systems. City stormwater systems drain in various fashions, in some cases directly into ACFWCD channels and in other cases through local creeks and into the San Francisco Bay.³⁴

The ACFWCD is the main flood control service provider in the County. The District is a dependent special district governed by the County Board of Supervisors. In 1949, enabling legislation created the District in response to serious flooding throughout the State and the County. In the 1950s and 1960s, streams and other waterways were channelized to allow for increased capacity and greater control of flood waters. Although the District's boundaries are countywide, the District's service area includes only the territory included within District zones (Table 6-1). Ten flood control zones have been created; zoned territory includes 10 cities and most unincorporated areas. The cities of Alameda, Albany, Berkeley, and Piedmont, and the unincorporated EBMUD watershed lands lie outside the zoned territory. Table 6-1 lists the flood control service providers in the County.

Zone 7 of the ACFWCD provides flood control service to the eastern part of the County, including the cities of Dublin, Livermore, and Pleasanton. Zone 7 is a quasi-independent district. Zone 7 has an independently elected board that has sole authority to govern matters relating only to Zone 7, although the County Board of Supervisors has governing authority on matters that also involve other zones of ACFWCD. Zone 7 staff operates independently from staff operating the other ACFWCD zones. In addition to flood control services, Zone 7 provides wholesale water service, as discussed in Section 4.

³⁴ For use in this report, flood control channels signify larger paved or natural waterways maintained by the ACFWCD, whereas creeks are smaller natural waterways that are maintained either by ACFWCD or cities within their jurisdictions.

**Table 6-1
Flood Control Service Providers**

Service Provider	Service Area	Watershed/Drainage Description
ACFWCD Zone 2	Portions of San Leandro, and Hayward and the unincorporated communities of Castro Valley, San Lorenzo, Ashland, and Cherryland	Many small creeks drain west from Castro Valley toward San Lorenzo Creek and flood control channels in the Zone
ACFWCD Zone 2A	Eastern portion of San Leandro	Pipes carry water to the channels in Zone 2
ACFWCD Zone 3A	Most of Hayward, a portion of Union City, and pockets of nearby unincorporated areas	Ward, Zeile, and Mt. Eden creeks drain to Old Alameda Creek and to the Bay
ACFWCD Zone 4	Western portion of Hayward	Channels drain the alluvial plan adjacent to the Bay
ACFWCD Zone 5	Newark, northern portion of Fremont, and portions of Hayward and Union City	Alameda Creek drain runoff originating in Livermore-Amador Valley through an alluvial plan adjacent to the Bay
ACFWCD Zone 6	Southeast portion of Fremont and unincorporated areas along Fremont’s eastern boundary	Coyote Creek and channels drain the alluvial plan adjacent to the Bay
ACFWCD Zone 7	Eastern half of the unincorporated portion of County and Livermore, Pleasanton, and Dublin	All of the major arroyos drain to the Arroyo de la Laguna which in turn drains to Alameda Creek and to the San Francisco Bay
ACFWCD Zone 9	Central portion of San Leandro	Pipes and channels carry water to the Bay
ACFWCD Zone 12	Oakland and Emeryville	Several small creeks drain to the Bay and Lake Merritt
ACFWCD Zone 13	San Leandro	The Zone comprises the watershed for San Leandro Creek
Alameda	Alameda	Area within city limits
Albany	Albany	Area within city limits
Berkeley	Berkeley	Area within city limits
Piedmont	Piedmont	Area within city limits

Source: Alameda County Flood Control & Water Conservation District: Neighborhood Zones

The cities of Alameda, Albany, Berkeley, and Piedmont provide their own integrated drainage services, including both stormwater and flood control functions. These cities are responsible for urban stormwater collection and substreet infrastructure. Drainage services provided by these cities are covered in Section 8 because their respective drainage systems are predominantly urban stormwater systems.

6.1.2 - OTHER SERVICE PROVIDERS

The U.S. Army Corps of Engineers (USACE) is a flood control service provider but is not under LAFCO jurisdiction. Under USACE’s PL84-99 Program, agencies in Alameda County may qualify to receive federal assistance in a federally declared disaster when criteria are met.

Agencies may also apply for other USACE programs for flood control planning, studying, and construction projects where applicable.

The California Department of Water Resources (DWR) is a flood control service provider but is not under LAFCO jurisdiction. The DWR is the primary State agency for flood management. Unlike local agencies responsible for operation and maintenance of local flood control facilities and flood control planning within their jurisdictions, DWR operates larger flood control facilities (primarily in the Central Valley) and programs, such as dams and a flood operations center, that serve Alameda County along with other areas of the State.

DWR's responsibility includes funding the local share of federal flood control projects, assisting the National Weather Service in flood forecasting, providing technical assistance to local agencies on complying with the National Flood Insurance Program, and expanding mapped areas that are prone to flooding. The DWR seeks to study and map areas outside the 100-year floodplain FEMA designation and conducts a statewide floodplain mapping program. The program receives its funding from the State general fund and Proposition 13 bond funds.

6.1.3 - SERVICE AREA

The service area for the Alameda County Flood Control and Water Conservation District includes most territory within Alameda County. Boundary lines for all the zones are shown in Figure 6-1. The County flood control system also services drainage that originates outside the County, as the natural watersheds do not align with the political boundaries.

Alameda Creek, Arroyo Las Positas, and Arroyo Mocho are some of the watersheds and sub-watersheds that drain into the County, and therefore, into the flood system. The districts take this into consideration when implementing improvements and planning for peak flows.

6.2 - Service Demand

This section provides indicators of service demand such as precipitation and developed areas within the 100-year floodplain. This section also discusses factors influencing service demand, as developed areas will increase in the future.

Flood control service demand is determined by factors such as precipitation levels and intensity, impervious surfaces, topography affecting the amount of runoff, and the prevalence of development in flood-prone areas. Precipitation amounts are not controllable, but proper planning can minimize flooding hazards and reduce service needs based on annual rainfall amounts. Rainwater is typically absorbed within the soil or dispersed as runoff into local creeks that flow into rivers and eventually the ocean. The amount of rainwater retained by the soil decreases dramatically with the expansion of impermeable surfaces, such as concrete or buildings. These areas contribute nearly all their rainwater to runoff, which in turn increases demand upon the flood control system.

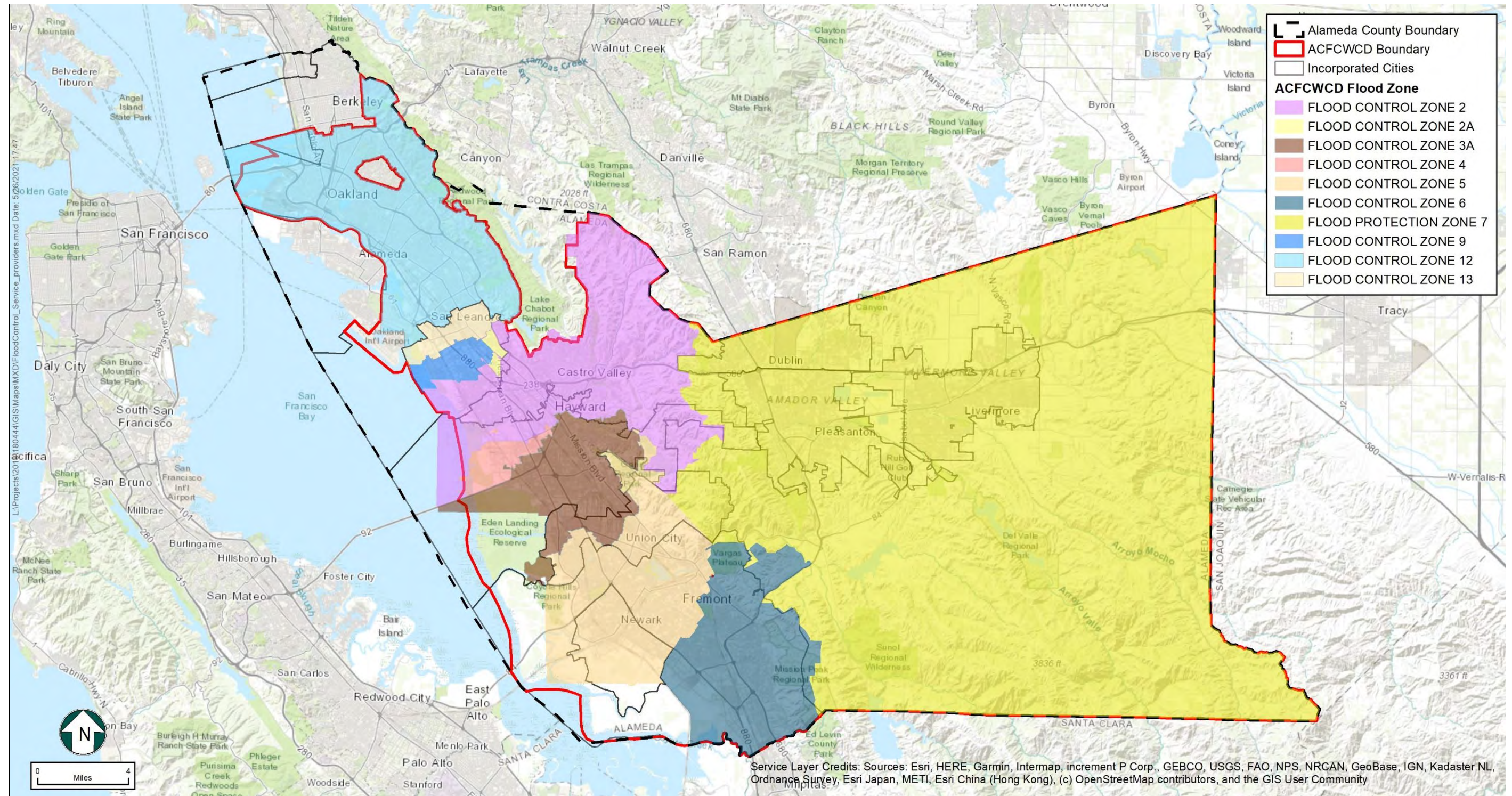


Figure 6-1
Flood Control Service Providers



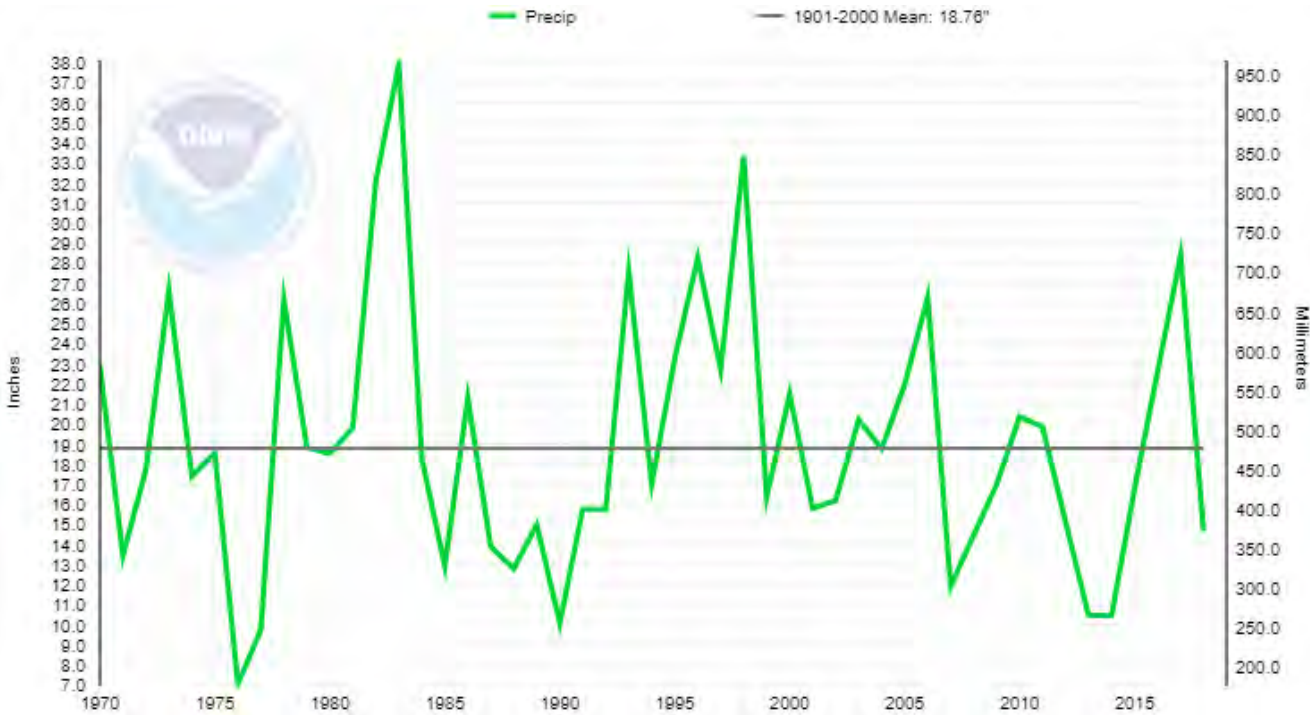
Demand on the system can be reduced with the introduction of proper planning techniques and materials, such as permeable asphalt, open space preserves, infiltration basins, and any method that reduces the amount of precipitation transformed into runoff.

6.2.1 - PRECIPITATION

A major factor influencing flood service demand is the amount of precipitation in the flood service area. This includes amount of rainfall, intensity of rainfall, and duration of storm events.

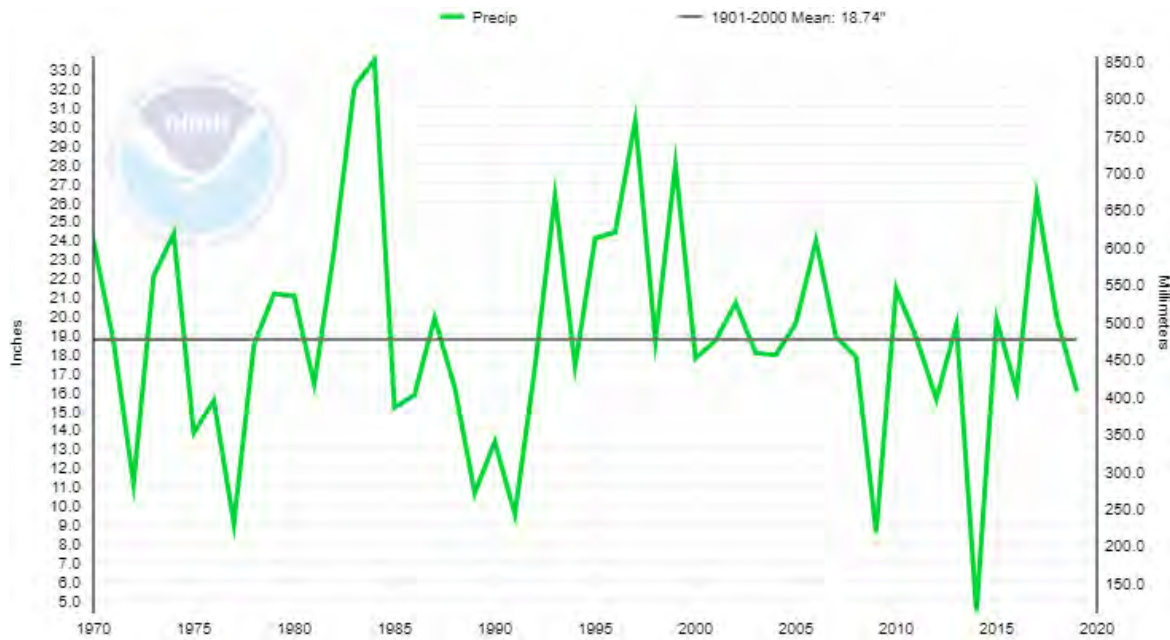
Precipitation levels in Alameda County vary substantially by year. Charts 6-1 and 6-2 show average rainfall since 1970, in inches, according to the National Oceanic and Atmospheric Administration. There have been 19 inches of rain on average in the County since 1970, ranging from as little as seven inches in 1976 to as much as 38 inches in 1983.

**Chart 6-1
Alameda County, California, Precipitation November-December³⁵**



³⁵ NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published October 2019, retrieved on October 10, 2019, from <https://www.ncdc.noaa.gov/cag/>

Chart 6-2
Alameda County, California, Precipitation, January-February



The County, similar to the State as a whole, experiences most of its rainfall during the winter months. Based on information obtained from the National Weather Service, over 80 percent of annual rainfall occurs between the months of November and March. Rainfall varies throughout the County and is heaviest in the coastal northwestern cities of Albany, Alameda, Berkeley, and Emeryville (National Weather Service Forecast Office, 2019) (National Weather Service, 2020). Heaviest rainfall tends to occur in January and February, reaching a maximum of four inches per day in coastal areas like San Leandro and three and a half inches in Livermore. Rainfalls greater than an inch per day occur an average of two times per year in inland areas and up to seven times a year in coastal areas. Areas with densely developed land face an increased risk of flooding hazards and effects on water quality due to higher rates and volumes of surface runoff.

6.2.2 - FLOOD-PRONE AREAS

Flood-prone areas are mapped by the Federal Emergency Management Agency (FEMA). FEMA has designated certain areas within Alameda County as falling within the 100-year floodplain. This 100-year flood is also called the one percent annual chance flood. This does not necessarily mean that this flood will happen only once every 100 years, but rather that there is a one percent chance on any given year that an area within this plain will flood.

Within the 100-year floodplain areas, FEMA requires flood insurance for property owners to get secured financing to buy, build, or improve structures. If infrastructure improvements reduce the chance of flood damage, FEMA may remove affected parties from the 100-year

floodplain and waive the flood insurance requirement. In some areas, infrastructure improvements cannot alleviate all risk of floods due to topographical constraints.

Flood-prone areas in Alameda County are small when compared to other counties. Most are located along the western edge of the County boundary. Furthermore, the majority of the area within the 100-year floodplain consists of Eden Landing Ecological Reserve and Don Edwards San Francisco Bay National Wildlife Refuge. A small portion of the 100-year flood area affects development. The majority of these areas are located near stream and low-lying coastal areas. There are also areas that the risk of flooding has yet to be determined within the 500-year floodplain, and areas that were at risk but have been reduced due to levees.

The undeveloped areas of some concern are Cayetano Creek, which flows north of Livermore, and the marshlands north of Coyote Creek, which are south of Newark. Few developed areas are within the 100-year floodplains in the cities of Alameda, Emeryville, Pleasanton, Newark, and San Lorenzo.

Developed areas within the 100-year floodplain are listed in Table 6-2. The risk of flooding to the areas described in Table 6-2 is one percent in a 100-year period. Zone 7 has a Comprehensive Stream Management Master Plan, which was last updated in 2006. The plan includes a goal of modifying the FEMA 100-year flood zone as necessary to protect people and property. To do this, the agency intends to “develop projects that reduce/eliminate flooding in commercial, residential, or public areas for projected 100-year storm event” (Zone 7, 2006).

6.2.3 - IMPERVIOUS SURFACES

Impervious surfaces increase runoff volume because they form a barrier between the rainfall, the underlying soil, and groundwater basins, thereby limiting percolation and groundwater recharge. As development proceeds, the prevalence of impervious surfaces, paved streets, sidewalks, driveways, building footprints, and parking lots tends to increase, often dramatically.

6.2.4 - EROSION

Erosion and sedimentation affect service needs. Erosion is the transport by wind, water, and ice of soil, sediment, and rock fragments produced by the weathering of geological features. Sedimentation occurs when eroded material that is being transported by water settles out of the water column and onto the surface as the water flow slows. Excessive sedimentation affects flooding by reducing channel capacities and preventing flood control facilities, such as storm outfalls and flap gates, from functioning properly. Also, excessive sedimentation or erosion can affect water quality and water supplies needed for humans, wildlife, and instream aquatic organisms by impacting water temperature, turbidity, and nutrient loading.

**Table 6-2
Developed Areas Within 100-Year Floodplain**

Service Area	Developed Areas in 100-Year Floodplain
Alameda	Area south of the Oakland Inner Harbor, especially at Svendsen’s Marine and Industrial Supply and next to the Marina Village Shopping Center on Webster Street.
Albany	Narrow strip along Codornices Creek.
Berkeley	Along creeks on the University of California campus, particularly the north fork of Strawberry Creek.
Dublin	Area along the Donald D. Doyle Highway (680) at the Dublin Place Shopping Center, industrial area north of I-580 and south of Dublin Boulevard which extends north into the Camp Parks Military Reservation, areas along the South San Ramon Creek and Alamo Creek, residential area at the corner of San Ramon Road and Silvergate Drive.
Emeryville	None
Fremont	Narrow strip along Alameda Creek. Fremont Police Department, Jail, & Animal Shelter in Central Park. Residential development west of Grimmer Park and east of Fremont Boulevard, industrial development along Business Center Drive.
Hayward	Industrial strip along the shoreline, from the San Lorenzo Creek in the north, south of State Route 92, to the southern portion of the South Bay Salt Pond Restoration Project.
Livermore	None. Floodplains along Arroyo Mocho, Altamont Creek, and Arroyo Las Positas cover open space and undeveloped areas.
Newark	None
Oakland	The Oakland International Airport. Small industrial area north of the Oakland Inner Harbor.
Piedmont	None
Pleasanton	Residential area east and west of I-680, along the Arroyo de la Laguna just north of the Arroyo Valle.
San Leandro	Large residential areas in southern San Leandro, including the neighborhoods of Marina Faire and Washington Manor-Bonaire.
Union City	Industrial area east of Alameda Creek, extending into a residential area surrounding the Old Alvarado Park.

To manage and control erosion, the ACFWCD and Zone 7 are subject to regulatory requirements for stormwater pollution control requirements on commercial and construction activities, which include grading, clearing, excavation, or other earth moving activities. The land use permitting agencies are responsible for carrying out the pollution control requirements in the unincorporated areas of the County.

The Alameda Countywide Clean Water Program (ACCWP) is the consortium of all permittees in Alameda County who are regulated under the San Francisco Bay Regional Water Quality Control Board, National Pollutant Discharge Elimination System (NPDES), and the Municipal Regional Permit (MRP). Through the ACCWP, the permittees decide which MRP requirements will be implemented individually and which will be implemented collaboratively at a countywide or regional level.

6.2.5 - PROJECTED DEMAND

In the future, as outlying areas become more developed and impervious surface areas increase, flood control capacity will need to keep pace with increased runoff amounts.

As the Livermore-Amador Valley has been transformed from rural to suburban land uses, the potential for flood runoff has steadily increased. Zone 7 projects significant increases in peak runoff and runoff volume as a result of increased impervious surfaces caused by the construction of buildings and paving of streets and parking lots (Zone 7 Water Agency, 2006). Increasing runoff, both quantity, and velocity, also results from natural floodplains that have been lost and natural arroyos that have been converted into trapezoidal channels. Runoff flows in Zone 7 drainage channels are projected to continue to increase until full buildout occurs, which is approximately in the years 2025–2034.

The ACFWCD and Zone 7 are currently addressing these issues through planned capital improvements and runoff reduction measures. The planned projects include curtailing aggradation of Altamont Creek by trapping sediment loads, diverting peak flows from Arroyo Las Positas by stabilizing channel banks, constructing floodwalls along Arroyo Seco, and other projects that generally involve diversion of peak flows from Arroyo Las Positas and Arroyo Mocho.

6.3 - Infrastructure Needs or Deficiencies

Infrastructure needs signify facilities that do not provide adequate capacity to accommodate current or projected demand for service for the region as a whole or for jurisdictions within the County. Current needs and deficiencies per each zone are shown in Table 6-3. Replacement of aging equipment and facility upgrades must also be undertaken.

6.3.1 - INFRASTRUCTURE CONDITIONS

The ACFWCD operates and maintains over 450 miles of channels and 22 pump stations as well as underground pipes and natural waterways. Routine maintenance is handled by County staff and includes duties such as vegetation removal, fence repair, debris removal, desilting, dredging, bioengineering, and pump maintenance.

The U.S. Army Corps of Engineers is currently in two projects involving the Alameda County flood control system. The first is a study of the South San Francisco Bay, extending from the City of Palo Alto to the City of San Leandro (US Army Corps of Engineers, 2019). The study investigated flood risk management and ecosystem restoration problems and opportunities, the issues of which are being addressed through a series of interim feasibility studies. The other project is the Estudillo Canal Investigation, which is located within the City of San Leandro (US Army Corps of Engineers, 2015). A substantial number of properties within this area are designated as being in a FEMA floodplain, and this study will evaluate potential flood-damage-reduction alternatives.

**Table 6-3
ACFWCD Needs and Deficiencies per Zone**

Zone	Need/Deficiency
Zone 2	The flood control infrastructure in both the San Lorenzo Creek and Castro Valley Creek watersheds are inadequate to carry large stormwater flows. The District is also in the midst of a Sulphur Creek levee remedial project between the Union Pacific Railroad and District Pump Station.
Zone 2A	None, just routine maintenance.
Zone 3A	The most recent Drainage Master Plan outlined \$75 million worth of improvement projects needed to provide 100-year flood protection. Other projects include Line A Desilting, Line A-5 Capacity Improvement, Line D Channel Improvement, Line D floodwalls, Line G-1 Alvarado Pilot Inboard Levee, and the Eden Landing Salt Pond Restoration Project.
Zone 4	Line A improvements to stabilize and restore the lower reach of Line A between the confluence of Line E and the Cabot Boulevard crossing. The District is also in the midst of improving levees to meet FEMA certification.
Zone 5	Capacity improvements to Line A, B, D, E, M, & M7. Also, Eden Landing Salt Pont Restoration and Scott Creek Restoration projects.
Zone 6	The District is in the midst of a Drainage Master Plan Update, which includes projects such as modifications to Lake Elizabeth and Laguna Creek, and removal of existing levees that were part of the former salt ponds complex. Other projects include improvements to Lines B, C, E, F, G, and N/N-1.
Zone 7	Major projects per the District’s Capital Improvement Program include: El Charro storage capacity increase, operation and maintenance of 37 miles of channels, construction of two new floodplains, and slope repair. The District adopted a program in 2019 for maintenance and repair that included 65 slide repairs – as of November, 62 have been completed.
Zone 9	None, just routine maintenance.
Zone 12	Improvements to Line J, K, N, P, & S. Also, San Leandro Creek rehabilitation.
Zone 13	None, just routine maintenance.

Source: Alameda County Flood Control and Water Conservation District: Neighborhood Zones, Zone 7 CIP

6.3.2 - OPPORTUNITIES FOR SHARED INFRASTRUCTURE

The flood control system throughout the County is interconnected, and multiagency cooperation is important for providing service. Both the ACFWCD and Zone 7 share in regulatory compliance costs through participation in the Alameda Countywide Clean Water Program. Through the Bay Area Stormwater Management Agencies Association (BASMAA), costs of regional stormwater studies and planning efforts are shared with cities, counties, and special districts that provide flood control or stormwater service in the Bay Area. BASMAA is the regional version of ACCWP. All of its activities are undertaken for compliance with the MRP.

The ACFWCD engages in extensive staff sharing. The District is staffed by the Alameda County Public Works Department, which maintains other County facilities. An opportunity for staff sharing exists between the Alameda Countywide Clean Water Program and ACRC.

There are minimal opportunities for shared facilities as flood control service is mostly a countywide effort.

6.4 - Service Standards and Adequacy

There are various measures of flood control service adequacy, which are based on agencies' ability to meet regulatory standards and performance benchmarks, success in avoiding flood damage, local plans and programs, and public education.

The ACFWCD and Zone 7 are two of 17 agencies jointly included in the countywide National Pollutant Discharge Elimination System (NPDES) permit for municipal stormwater. As of October 2009, the 17 Alameda County agencies are included as co-permittees with 60 other regional agencies by the new joint Municipal Regional Stormwater permit issued under the NPDES. The District, which provides administrative and contracting services for the program, has been involved in extensive planning given new regional permit guidelines. ACFWCD and Zone 7 activities include watershed assessment and monitoring, public outreach, and illicit discharge control. The flood control providers are responsible for meeting a regulatory standard. ACFWCD and Zone 7 are in compliance.

FEMA is responsible for mapping territory as inside or outside the 100-year floodplain. One measure of service adequacy is the construction and maintenance of flood control infrastructure to reduce or limit the expansion of the 100-year floodplain by expanding channel capacity and by diverting flows. FEMA periodically conducts flood insurance studies of previously studied areas as well as newly studied areas. FEMA finalized its new flood maps in 2018, which shows thousands of parcels within Alameda County that now fall within the 100-year floodplain. The areas of the 100-year floodplain are increasing, but ACFWCD Zone 7's Capital Improvement Program aims to limit this trend.

The Alameda County Public Works Agency oversees the management and daily operation of the ACFWCD. The agency conducted a benchmark study in 2000 comparing its performance in 10 maintenance activities (including flood control) to the performance of other public agencies throughout the nation (Burr Consulting, 2005).

The ACFWCD has not recently conducted a benchmark survey to determine service standards and adequacy, but the agency does publish annual reports. The most recent one published on their website is the 2016 Annual Report. The report states, "many parts of Alameda County received more than two hundred percent of average precipitation during the 2016-2017 winter season...(but) little to no flooding occurred in Alameda County...Our flood control system was able to handle the sustained flows" (Alameda County Flood Control, 2016).

Zone 7 has not recently conducted a benchmark survey to determine service standards and adequacy, but the agency keeps diligent track of its construction and repair activities in order to maintain their service standards. For example, the agency has completed 65 of the 68 total projects for 2019. The only three projects left are minor road work in Dublin, V-ditch cleaning and fence line vegetation in northeast Livermore, and bridge maintenance in

northeast Livermore. All three projects are scheduled for repair in 2019. The agency also performs routine inspections of its infrastructure. ACFWCD Zone 7 releases an annual report that covers all agency functions.

6.4.1 - ADDRESSING INFLOW AND INFILTRATION

Both inflow and infiltration influence, or are influenced by, flood control systems. Inflow is stormwater that enters into sanitary sewer systems at points of direct connection to the systems. Examples include footing/foundation drains, roof drains, downspouts, drains from window wells, etc. The water should be entering the stormwater sewer system or allowed to soak in the ground without entering the sanitary system. Infiltration is the process by which water on the ground surface enters the soil (Science Daily, 2019). If the precipitation rate exceeds the infiltration rate, runoff will usually occur unless there is some physical barrier. Inflow and infiltration can cause problems with flood systems when the system is overflowing with too much water too quickly. By utilizing strategic methods to prevent an influx of water into the system, agencies can mitigate potential issues.

Both the ACFWCD and Zone 7 have strategies to combat excessive inflow and infiltration. Combating excessive water from entering the system is essentially diverting water away from the system or slowing down the rate at which the water enters the system. Green Infrastructure (GI) implementation, such as the use of landscape swales, is a popular, eco-friendly strategy.

One of the projects and programs on the ACFWCD's website is Green Infrastructure. They describe it as a way to use "vegetation, soils, and other elements and practices to capture, infiltrate, treat, and slow urban runoff" (Alameda County Flood Control & Water Conservation District, 2017). The Alameda County Public Works Agency has converted two parking lots into a GI demonstration project area. The site consists of 14 GI features which are described on interpretive panels and integrated into a self-guided public tour. Training workshops for professionals in stormwater management, landscape architecture, construction, and maintenance are held onsite. Some features included at the site are a full trash capture device, pervious concrete and asphalt, and articulated concrete blocks. This project is a part of a larger Green Infrastructure Plan implemented by the County's Public Works Agency.

Other ways the ACFWCD has tackled excessive inflow and infiltration are with their 'San Leandro Creek Comprehensive Vegetation Management Plan (VMP)' and their 'Interim Total Trash Capture Device (TTCD)' Project. One of the VMP's goals is to "Assure that the District meets its flood protection mission" (URS Corporation, 2015). One of the objectives of that goal is to "reduce creek bank erosion with the VMP." The plan describes specific plants and other types of vegetation, called a "native seed mix," which will be strategically planted in order to reduce erosion and sedimentation, thus preventing infiltration into the stormwater system. The TTCD Project includes the installation of properly sized trash control devices that capture trash debris in channel flows without adverse hydraulic effects upstream (Alameda County Public Works Agency, 20018). By removing this potentially harmful trash,

less stress is placed on the stormwater system, giving it the opportunity to run more effectively and maintain capacity.

Zone 7's most recent Stream Management Master Plan also takes an eco-friendlier approach to flood protection, even though it's not officially considered to be a Green Infrastructure Plan. The vision of the plan over the next three decades is to "create a flood-protection program that relies largely on using the future Chain of Lakes, a series of mined-out gravel pits between Livermore and Pleasanton, to detain stormwater in the Valley. The stored water would be released downstream only after storms pass through the area, meaning the arroyos can be kept in a more natural state than under the channelization method" (Zone 7 Water Agency). This strategy is less expensive than the previous methods to control flooding. It also affords opportunities to improve the agency's water supply through groundwater recharge, enhance arroyo water quality and habitat, increase the connectivity of trail and recreational opportunities in the Valley, and promote public understanding of the watershed through educational programs.

6.4.2 - SERVICE CHALLENGES

Zone 7 published a Stream Management Master Plan (SMMP) in 2006. An update is currently underway but not yet published. The 2006 document addresses the needs and opportunities for the agency. The two main needs pertaining to flood control are the assessment of the flooding potential along the Valley's streams and arroyos resulting from a 100-year flood event and sediment deposition throughout the watershed.

To effectively identify the needs and opportunities for flooding, Zone 7's service area was subdivided into 12 individual reaches that were studied through literature review, field investigation, and several workshops with stakeholders. Most of the flood protection studies have recognized the linkages between peak flows in the upstream and downstream arroyos and the importance of evaluating the timing of the peaks for each arroyo. The SMMP identified primary areas subject to flooding, including:

- Area around the Chain of Lakes in the City of Livermore, bound to the west by the confluence of Arroyo Mocho and Arroyo Las Positas, and to the east by Isabel Avenue.
- The Springtown Natural Communities Reserve along Altamont Creek, in the northeast corner of the City of Livermore.
- Areas in Dublin, upstream of Interstate 580 discharging to Chabot Canal and adjacent to the Interstate 580/680 crossing.
- Lands along Arroyo Mocho, within the Chain of Parks area (from Robertson Park to Mocho Park) and adjacent to Valley Memorial Hospital in the City of Livermore.
- Smaller areas along realigned Arroyo Las Positas, Arroyo Del Valle, and lower ADLL.

Since the publishing of the SMMP in 2006, FEMA has since updated its maps, and Zone 7 is in the midst of updating its SMMP. Analysis of the new SMMP, once published, along with the current FEMA maps, will be able to determine the most current service challenges of Zone 7.

Sediment deposition is the second service challenge of Zone 7. The District's channels and arroyos have experienced excessive erosion and sediment deposition throughout the watershed. Sedimentation is a natural and essential process, but excessive deposition impedes the function of flood control facilities such as storm drains, outfalls, and flap gates, resulting in potential effects on the drainage of adjacent properties. Eleven out of the 12 areas the agency calls "reaches" experienced excessive sediment deposition of some sort.

The Alameda County Capital Improvement Plan from Fiscal Years 2019–2020 through 2023–2024 describes the present and future flood projects of ACFWCD. Projects include flood control restoration, major flood control maintenance, watershed/special studies, and flood control capacity improvement projects. The total cost of the projects in 2020 is projected to be \$36,383,000, with a total flood project expenditure of \$187,123,950 from 2020 to 2024 (Alameda County Public Works, 2019).

The flood control restoration projects are projected to cost \$7.7 million in 2020 (Alameda County Public Works, 2019). These projects aim to restore natural creek functions, provide for the passage of fish, restore creek ecosystems, and provide for improved water quality in the County's creeks and channels.

The major flood control maintenance projects are projected to cost \$7.9 million in 2020 (Alameda County Public Works, 2019). These projects aim to restore the original design capacity of the existing system, repair failing portions of the system, extend the useful life of the system, and keep the system performing as planned.

The watershed/special studies are projected to cost \$475,000 in 2020 (Alameda County Public Works, 2019). These studies aim to identify areas of needed flood control improvements, analyze the impacts of new development on flood protection, identify areas where it may be possible to develop environmental restoration projects without compromising flood protection and identify the impacts of continued sea-level rise on the flood control channels that discharge into the Bay.

The Flood Control Capacity Improvement Projects are projected to cost \$20.2 million in 2020 (Alameda County Public Works, 2019). These projects aim to increase the flood protection of the existing system, expand the system by building new flood protection facilities where the District had none before, and improve the operating efficiency of the existing system.

6.5 - Financing Constraints and Opportunities

Service-related financing constraints and opportunities are discussed in this section. The scope includes revenue sources, financing constraints, rates, and connection fees. The section identifies financing, rate restructuring, and cost-avoidance opportunities.

6.5.1 - FINANCING RESOURCES

Service charges, connection fees, property tax, assessments, and voter-approved measures are significant revenue sources for flood control enterprises in Alameda County. There is a

basic difference in how single service and multiservice agencies collect funds for flood control enterprises. It appears that multiservice agencies are able to split overhead costs within their rates of multiple municipal services in order to provide lower overall costs for flood control services, whereas single service agencies must include all overhead within the rate for flood control service.

Approximately 81 percent of all revenues for these agencies comes from property tax or assessments, general fund allocations, or intergovernmental transfers (see Chart 6-3). Table 6-4 breaks down the revenues of each agency. Funding by the special districts is much different than the cities. As a specialized service provider, funding is directly tied to providing the enterprise, whereas cities are tasked with allocating funds for multiple service needs. Therefore, cities are forced to “pick and choose” allocations of revenues from the general fund to support facilities in the most need of repair in some cases. Therefore, flood control facilities may be underfunded in some years and may go underfunded until a critical issue arises.

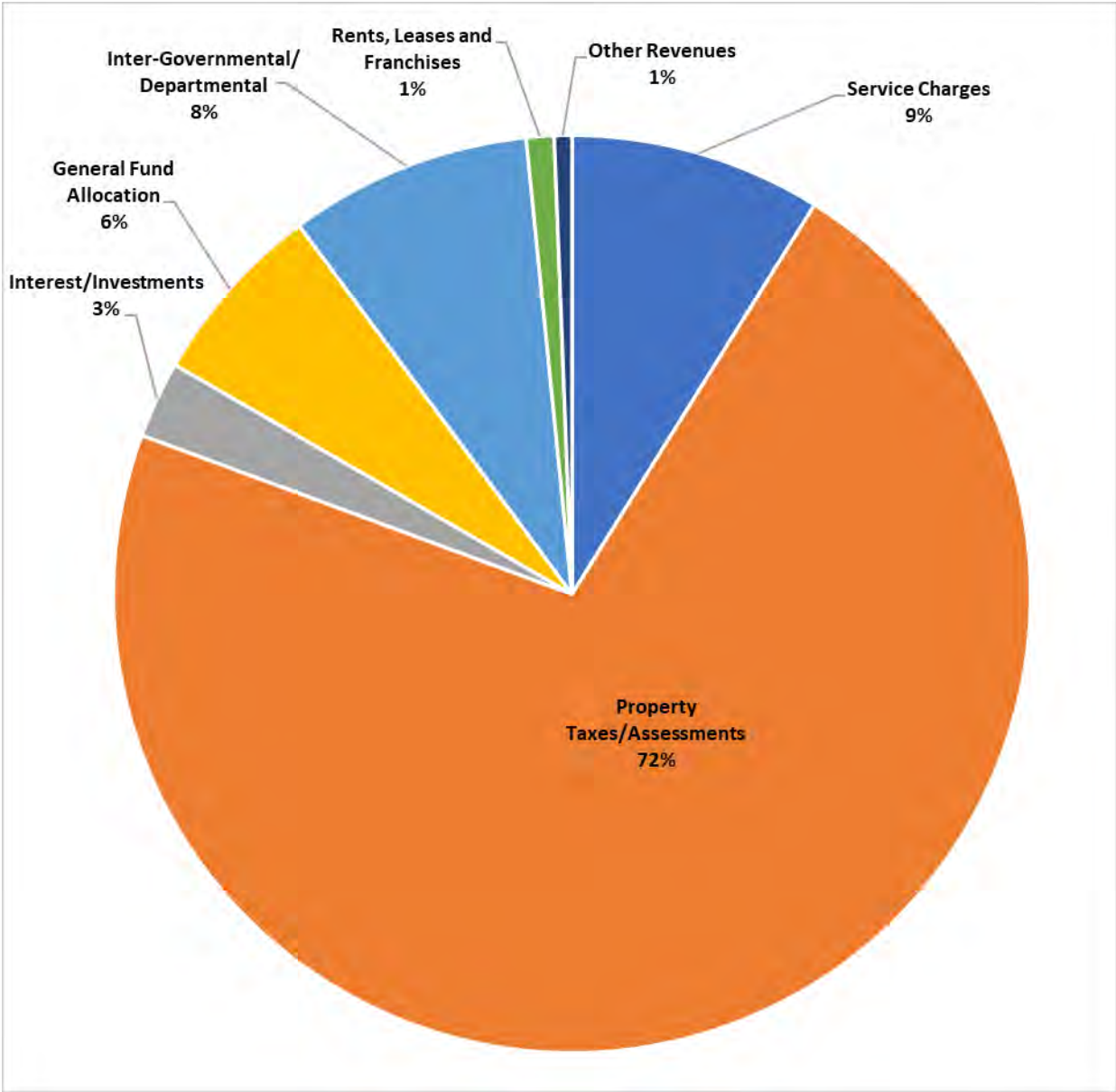
Service charges only comprise about nine percent of total revenues, which is much different than traditional service providers than a specific enterprise. Rents, leases, and franchise agreements comprise only about one percent of total revenues.

Property taxes are subject to State constitutional limits established under Proposition 13. Furthermore, these revenues fluctuate with market conditions, as was seen during the Great Recession when property taxes did not recover at the same rate in which they declined due to Proposition 13 requirements. Service charges are much more stable as they are not subject to property valuation changes. Generally, they are established through the Proposition 218 process and accompanied by an engineering study that establishes an assessment for a specific purpose to be levied to property owners. That assessment can be adjusted annually with inflation as well, which makes a more reliable revenue source than property tax. However, no agency relies more than nine percent on these sources. Since these agencies are heavily reliant on property taxes, they may see more fluctuation in revenues than other agencies that are less reliant on property taxes and that are able to adjust rates based on inflation or other indexes from year to year.

Return on investments is a relatively simple way for agencies to accumulate additional revenue from the revenues or reserves which they have accumulated. However, this amount is considerably more than water enterprises as it comprises almost three percent of total revenues.

Interdepartmental or governmental transfer is a revenue source for only the special district agencies that involve items such as credits for homeowners living within the district or transfer of money from another agency to the flood control enterprise. Some of these agencies have many other revenue sources that they could essentially loan the flood control enterprise if needed.

Chart 6-3
Flood Control Agency Revenue Sources (2018)



Lastly, all other revenue sources only comprise about one percent of overall revenues. The fact that these sources are not heavily relied upon is important because it is likely that many revenue sources that are categorized as other may be one-time type sources and may not be available in future budgetary years.

**Table 6-4
Flood Control Agency Revenues (2018)**

Flood Control Agency	Service Charges	Property Taxes/ Assessments	Interest/ Investments	General Fund Allocation	Inter-Governmental/ Departmental	Rents, Leases, Franchises, and Other Revenue	Total
ACFCWCD	\$2,611,672 4%	47,794,594 82%	\$1,320,617 2%	\$0 0%	\$5,597,700 10%	\$908,417 2%	\$58,233,000
Zone 7	\$4,566,846 29%	\$8,518,064 55%	\$897,199 6%	\$0 0%	\$1,413,239 9%	\$119,870 <1%	\$15,515,218
Alameda	\$0 0%	\$0 0%	\$0 0%	\$5,085,272 100%	\$0 0%	\$0 0%	\$5,085,272
Albany	\$101,223 19%	\$295,300 55%	\$1,350 <1%	\$138,533 26%	\$0 0%	\$0 0%	\$536,406
Berkeley	\$0 0%	\$2,261,496 89%	\$0 0%	\$0 0%	\$0 0%	\$285,152 1%	\$2,546,648
Piedmont	\$0 0%	\$0 0%	\$0 0%	\$125,000 100%	\$0 0%	\$0 0%	\$125,000
TOTAL	\$7,279,742 9%	\$58,869,457 72%	\$2,219,166 3%	\$5,348,807 6%	\$7,010,939 9%	\$806,029 1%	\$82,041,544

6.5.2 - FINANCING CONSTRAINTS

Flood control providers may maintain an enterprise fund for the services provided separate from other funds and may not use revenues to finance unrelated governmental activities. Local agencies providing flood control services are required to maintain separate enterprise funds to ensure that finances are not commingled with the finances of other enterprises, such as water. Cities may not use the enterprise fund to finance general fund activities. Conversely, it is not illegal for a city to use general funds to support the flood control enterprise but is generally not favorable as it shows that the enterprise is not solvent and cannot support itself based on its current rate and operations structure. However, all the cities, with the exception of Berkeley, which has a property based special assessment that helps fund flood control services, utilize general fund allocations, which may allow for fluctuation of revenues for this service due to these funds being able to be used for other services, such as police, fire, and other utilities such as water, sewer, streets, and lighting.

Since the general fund is the primary funding source for flood control services, agencies must be cognizant of their infrastructure vulnerabilities and needs. For example, understanding the overall costs of deferred maintenance allows for programmatic improvements to be made through a Capital Improvement Program over a period of years. This five to 10-year plan would allow the agency to properly plan needed improvements in order to maintain adequate levels of service while also prioritizing funding between critical infrastructure systems.

The primary financing restrictions of public agencies are the limitations associated with rate increases and compliance with Proposition 218. Proposition 218 is a costly and involved process that requires justification for increases associated with operating the enterprise but also eventually requires approval of the voters. Generally, voter support has been difficult for agencies across the State to generate for any increase in financial obligations, such as fees or rates. Therefore, providing informative outreach and education is increasingly important to the viability of any increase in financial revenues under Proposition 218.

Propositions 13, 218, 26, and the Mitigation Fee Act are State constitutional and statutory provisions that establish various limits to how revenue can be generated by local agencies. A more detailed description of how these propositions constrain public agency revenues can be found in Section 4.5.2 of this MSR.

6.5.3 - FINANCING OPPORTUNITIES

There are two basic types of financing opportunities available to agencies. The first being one-time funds, such as grants, that may be used for a strategic need or project that helps to reduce the financial burden on ratepayers within the limits of the agency. These funds are usually competitive and require forward design and planning to be presented for funding from the grant or bond. The second type of funding is ongoing financial resources, such as taxes and rates. These funds are available annually through agency collection activities and

are adopted through various methods, such as the annual budget or Proposition 218 process. These ongoing funding types are much more significant to the financial health of an agency.

Issuance of Bonds

Agencies may issue bonds to aid with funding infrastructure and improvements. However, the issuance of bonds requires sound budgeting as they become a debt service to the agency for a period, typically 20 to 30 years. That debt service must be paid back by the agency in order to maintain a decent credit rating. Decline in credit rating to limit the agencies' ability to earn other financial loans or issuance of bonds in the future. The agency may pay off bonds early if resources are available. Agencies may also include bond payments within the rate structure to aid in payback as well, but these increases typically require approval by customers in accordance with Proposition 218.

Increase Rates, Fees, and Special Taxes in accordance with Proposition 218

On November 5, 1996, the California electorate approved Proposition 218, the self-titled "Right to Vote on Taxes Act." Proposition 218 adds articles XIIC and XIID to the California Constitution and makes numerous changes to local government finance law. Proposition 218 was approved by a 56.6 percent to 43.4 percent vote. It requires voter approval for increases in general or special taxes, special assessments, and other property-related charges. The hurdle of obtaining a majority approval, and in some cases a two-thirds majority, by the electorate, has often limited the ability of agencies to increase revenues. In some cases, critical and unique issues do not require significant outreach to educate the electorate as it has already been publicized or creates a critical issue that residents want to resolve. In other cases, residents may review an increase in assessments or other charges as overreaching. The burden of proof to convince customers and voters is an issue that all agencies must consider when attempting to increase revenues subject to Proposition 218 through the electorate.

6.5.4 - RATES

It does not appear that any of the flood control agencies maintain actual rates to customers for direct service. Each agency uses some form of allocated funds to fund flood control services, with the exception of Berkeley who uses a special assessment. As a result, there is no comparison of rates for this service.

6.5.5 - RESTRUCTURING OPPORTUNITIES

Restructuring of flood control agencies could be realized by the consolidation of services to a regional provider. However, many of the agencies that provide flood control services do so in collaboration with road maintenance of their streets. The cities coordinate their flood control maintenance services along with street sweeping or repairs. As a result, the cities may be better equipped to do cleaning and other maintenance within the right of way.

The maintenance of regional facilities may be better maintained by regional agencies, such as the ACFCWCD or Zone 7, due to their regional oversight and ability to utilize economy of scale to maintain and develop such facilities. It is very similar to the circumstance with sewer treatment facilities. Many cities are not able to properly fund or maintain a regional plant, but an agency that covers multiple jurisdictions is able to realize the economy of scale for providing a similar service.

Additionally, the watershed areas are better defined by geographic region rather than political boundaries. Therefore, regional agencies may be a better oversight for overall flood control services since watersheds span larger areas, and coordination is required between agencies.

6.5.6 - COST AVOIDANCE OPPORTUNITIES

Cost avoidance opportunities are dependent on each agencies' willingness to communicate and share information with other agencies. Additionally, ACFCWCD is a regional agency that covers almost the entire watershed of the County as it relates to flood control. The cities that operate and conduct flood control operations and maintenance may realize general fund revenue by allowing the ACFCWCD to take over their flood control responsibilities, as the District already conducts business throughout the County for other cities. The understanding the District has gained through its operations may be a cost-saving to the cities, allowing the District to perhaps acquire additional revenues for service and achieve a more efficient economy of scale for providing services in the region. The District is a logical service provider which already understands the regional landscape and city needs and could potentially take over these services from these cities, allowing them to potentially allocate funds to other services or infrastructure needs.

6.6 - Policy Analysis

This section provides policy analysis that is focused on local government agencies that provide flood control services. The policy analysis includes assessment of local accountability and governance, evaluation of management efficiencies, as well as the identification of government structure options that may be considered by LAFCO.

6.6.1 - LOCAL ACCOUNTABILITY

This section discusses local accountability and governance for the limited purpose agency and provides an overview of indicators of local accountability and governance for the multipurpose agencies.

Both the Alameda County Flood Control District and Zone 7 hold open elections for their governing bodies, prepare meeting agendas and minutes, and make staff and elected officials accessible. The ACFWCD is governed by the five-member County Board of Supervisors, each of whom is elected on a non-partisan basis from a separate district where he/she lives. To make the supervisorial districts equal in population, the boundaries are adjusted every 10 years. Terms of office for the supervisors are four years. Alternate elections are held every

two years for three supervisors and then for two supervisors. The Board updates constituents, broadcasts its meetings, solicits constituent input, discloses its finances, and posts public documents on its website.

The Zone 7 Water Agency is governed by an independently elected, seven-member Board of Directors. Board members serve four-year terms and represent the public throughout the Livermore-Amador Valley. Meetings are open to the public, and community input and participation are welcome. Community members may provide comments to the Board on any agenda item and may address the Board about non-agenda items during each meeting's Citizens Forum.

6.6.2 - EVALUATION OF MANAGEMENT EFFICIENCIES

This section provides an analysis of management efficiencies at the local flood control agencies and considers the effectiveness of each agency in providing efficient, quality public services.

The ACFWCD management practices include benchmarking, financial audits, and performance evaluation. To monitor productivity within the District, its engineers develop labor cost estimates and project schedules for each project. The labor costs and project schedules are monitored monthly. Workload is also monitored through monthly work assignment status updates. Alameda County adopted a Capital Improvement Plan in FY 2019-2020 with a time horizon of five years.

Zone 7 has adopted planning documents on flood control service issues, including a Capital Improvement Plan in FY 2018-2019 with a time horizon of 10 years and a Stream Management Master Plan in 2006 that addresses several long-term service issues. Zone 7 management practices include financial audits and performance evaluation. Zone 7 tracks workload through the individual personnel performance evaluation and task planning and monitoring for its Engineering, Water Resources, and Maintenance Departments. To monitor productivity within the District, every department monitors employee assignments on a project basis. Additional management practices conducted by the District include performance-based budgeting.

ACFWCD and Zone 7 are regional flood control service providers in the County. ACFWCD provides management efficiencies by utilizing County employees that can also be assigned to other County maintenance services. Since flood control service management and effectiveness in the cities of Alameda, Albany, Berkeley, and Piedmont are closely related to the effectiveness of stormwater service, it is appropriate that they continue to provide the service within their jurisdictions. The agencies work together to limit pollutant levels in the runoff and meet State urban runoff requirements.

6.6.3 - GOVERNMENT STRUCTURE OPTIONS

The cities of Alameda, Albany, Berkeley, and Piedmont provide their own integrated drainage services, including both stormwater and flood control functions. These cities are

responsible for urban stormwater collection and substreet infrastructure. Berkeley, Albany, and Alameda have developed areas within the 100-year floodplain. If they were ever interested, cities could negotiate with the County to become an ACFWCD zone since the boundary of ACFWCD encompasses the entire County. The Board of Supervisors is empowered to create and alter zones. Because the internal zones are not “districts” as defined in the CKH Act, LAFCO does not have jurisdiction over the creation of or the boundaries for the various zones of the ACFWCD. Hence, no government structure options under LAFCO jurisdiction were identified.

6.7 - Determinations

- The Alameda County Flood Control and Water Conservation District (ACFWCD) is the main flood control service provider in Alameda County and is governed by the County Board of Supervisors. The ACFWCD flood control system is an integrated part of local stormwater systems built and managed by the cities and functions as an extension of the local cities’ stormwater systems. City stormwater systems drain in various fashions, in some cases directly into ACFWCD channels and in other cases through local creeks and into the San Francisco Bay. The ACFWCD is divided into 10 zones.
- Zone 7 of the ACFWCD provides flood control service to the eastern part of the County, including the cities of Dublin, Livermore, and Pleasanton. Zone 7 is a quasi-independent district. Zone 7 has an independently elected board that has sole authority to govern matters relating only to Zone 7.
- The cities of Alameda, Albany, Berkeley, and Piedmont provide their own integrated drainage services, including both stormwater and flood control functions. These cities are responsible for urban stormwater collection and substreet infrastructure.
- Flood control service demand is determined by factors such as precipitation levels and intensity, impervious surfaces, topography affecting the amount of runoff, and the prevalence of development in flood-prone areas. Precipitation amounts are not controllable, but proper planning can minimize flooding hazards and reduce service needs based on annual rainfall amounts.
- A major factor influencing flood service demand is the amount of precipitation in the flood service area. This includes amount of rainfall, intensity of rainfall, and duration of storm events. Flood-prone areas in Alameda County are small when compared to other counties. Most are located along the western edge of the County boundary.
- To manage and control erosion, the ACFWCD and Zone 7 are subject to regulatory requirements for stormwater pollution control requirements on commercial and construction activities, which include grading, clearing, excavation, or other earth moving activities. The land use permitting agencies are responsible for carrying out the pollution control requirements in the unincorporated areas of the County.

- The ACFWCD and Zone 7 are currently addressing increased stormwater runoff caused by new construction and paving through planned capital improvements and runoff reduction measures. The planned projects include curtailing the aggradation of Altamont Creek by trapping sediment loads, diverting peak flows from Arroyo Las Positas by stabilizing channel banks, constructing floodwalls along Arroyo Seco, and other projects that generally involve diversion of peak flows from Arroyo Las Positas and Arroyo Mocho.
- The flood control system throughout the County is interconnected, and multiagency cooperation is important for providing service. Both the ACFWCD and Zone 7 share in regulatory compliance costs through participation in the Alameda Countywide Clean Water Program.
- The ACFWCD engages in extensive staff sharing. The District is staffed by the Alameda County Public Works Department, which maintains other County facilities. Although ACFWCD and Zone 7 do not share staff, Zone 7 contracts with ACFWCD for certain flood control maintenance services from ACFWCD.
- Both the ACFWCD and Zone 7 have strategies to combat excessive inflow and infiltration. Combating excessive water from entering the system is essentially diverting water away from the system or slowing down the rate in which the water enters the system. Green Infrastructure (GI) implementation, such as use of landscape swales, is a popular, eco-friendly strategy.
- According to the Zone 7 Stream Management Master Plan (SMMP), the two main needs pertaining to flood control are the assessment of the flooding potential along the Valley's streams and arroyos resulting from a 100-year flood event and sediment deposition throughout the watershed.
- Approximately 81 percent of all revenues for flood control services comes from property tax or assessments, general fund allocations, or intergovernmental transfers.
- All the cities providing flood control services utilize general fund allocations, which may allow for fluctuation of revenues for this service due to these funds being able to be used for other services. An exception is the City of Berkeley, who has a property-based special assessment that helps fund flood control services.
- The ACFWCD management practices include benchmarking, financial audits, and performance evaluation. To monitor productivity within the District, its engineers develop labor cost estimates and project schedules for each project. The labor costs and project schedules are monitored monthly. Workload is also monitored through monthly work assignment status updates. Alameda County adopted a Capital Improvement Plan in FY 2019-2020 with a time horizon of five years.

- Zone 7 has adopted planning documents on flood control service issues, including a Capital Improvement Plan in FY 2018-2019 with a time horizon of 10 years and a Stream Management Master Plan in 2006 that addresses several long-term service issues. Zone 7 management practices include financial audits and performance evaluation.

SECTION 7 - STORMWATER SERVICES

7.1 - Service Overview

This section discusses the stormwater drainage services in Alameda County. The section addresses current and future service needs, infrastructure needs, financing constraints and opportunities, and policy analysis for each service provider.

Stormwater is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The stormwater may recover pollutants like trash, chemicals, oils, and dirt/sediment that can harm our rivers, streams, lake, and coastal waters (United States Environmental Protection Agency, 2019).

Stormwater service usually refers to the operation and maintenance of local stormwater drainage facilities, including collection, conveyance, and discharge systems. Section 6 analyzes flood control facilities in Alameda County. Flood control and stormwater services are similar in the type of conveyance systems, and both systems can be connected.

7.2 - Services

Stormwater services within Alameda County are typically handled by each municipality and by the Alameda County Flood Control and Water Conservation District in unincorporated areas. Currently, the County provides stormwater services for Five Canyons CSA.

In Alameda County, all the municipalities and Flood Control District have joined together in the Alameda Countywide Clean Water Program (ACCWP) and are regulated by the RWQCB San Francisco Region. These agencies and municipalities within Alameda County are Alameda County, Alameda County Flood Control and Water Conservation District, cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City, and Zone 7 Water Agency. The ACCWP was established in 1991 through a Memorandum of Agreement.

The ACCWP facilitates local compliance with the Federal Clean Water Act, helping all the Alameda County permittees facilitate compliance with the MRP. The ACCWP also works with public agencies from around the County to foster a culture of stewardship, educating residents and businesses alike on how to prevent stormwater pollution. ACCWP is not an independent entity, but rather it is comprised of the public agencies who collaborate on initiatives. All implementation happens at the permittee level. The agencies of the ACCWP implement best management practices (BMPs) with the California Stormwater Quality Association. This association has developed BMPs for construction of commercial and industrial development and municipal and new development & redevelopment (Alameda Countywide Clean Water Program, 2003).

7.2.1 - SERVICE PROVIDERS

Stormwater services in Alameda County are provided directly by cities in their respective jurisdictions and by the County in unincorporated areas. They are listed in Table 7-1, and their locations are shown in Figure 7-1. Some cities contract with special districts or private providers to perform permitting and preventive stormwater services. The Five Canyons CSA serves the northeast portion of the unincorporated Fairview area.

**Table 7-1
Matrix of Services**

Service Provider	Maintenance	Permitting/ Inspections	Preventing
Alameda	City	City	City
Albany	City	City	Private (street sweeping)
Berkeley	City	City	City
Dublin	City and Private	City	Private (street sweeping)
Emeryville	City	Ac Environmental Health (inspection)	Private (street sweeping)
Fremont	City	Union Sanitary District (inspection)	City
Hayward	City	City	City
Newark	City	City	City
Livermore	City	City	City
Oakland	City	City	City
Piedmont	City	City	City
Pleasanton	City	City	City
San Leandro	City	City	City
Union City	City	City	City
Five Canyons CSA	County	County	County
County Area	County	County	LAVWMA and EBDA

Source: Alameda Storm drain Master Plan 2008, City of Albany General Plan 2035, City of Berkeley Storm Drain Master Plan 2019, City of Dublin General Plan 2017, City of Emeryville General Plan 2019, Fremont Contractual Service Agreement with USD, City of Hayward Urban Water Management Plan 2015, City of Livermore Storm Drain Master Plan 2004, City of Oakland Storm Drain Master Plan 2006, City of Piedmont General Plan 2011, City of Pleasanton Urban Water Management Plan 2015, City of San Leandro General Plan 2035, Union City General Plan 2035

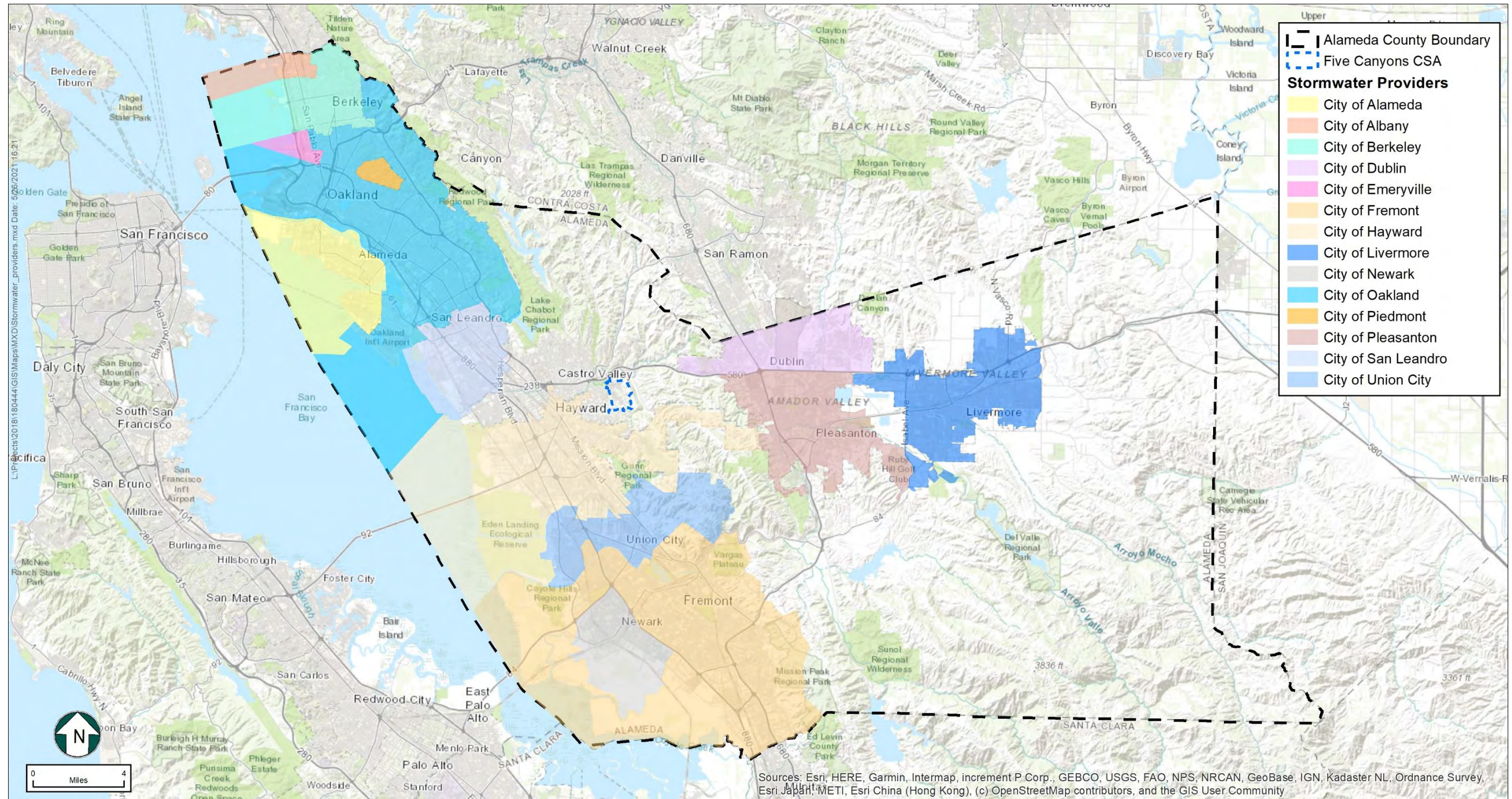


Figure 7-1
Stormwater Service Providers



Stormwater and drainage services include direct maintenance services, preventative maintenance, regulatory activities, and pretreatment services. The direct maintenance services include removal of blockage from storm drainage and piping, cleaning of stormwater inlets and basins, and repair of stormwater infrastructure. Preventative services include open space litter control, street sweeping, and inspection of inlets. Regulatory activities involve public outreach and education, industrial and commercial discharger permitting and inspections, development of source controls, site design for development projects, and inspection for illicit wastewater discharge, among other things.

Pretreatment involves onsite treatment and retention methods to prevent polluted runoff from reaching the storm drain system. These methods include vegetated swales, surface sand filters, retention ponds, bioretention units, gravel wetland units, porous asphalt pavement, tree box filters, and other devices. The ACCWP advocates the implementation of local and pretreatment methods because stormwater treatment is prohibitively expensive.

There are no dual wastewater-stormwater collection systems in Alameda County. Stormwater that seeps into the wastewater system (i.e., infiltration and inflow) is treated, as discussed in Section 4. Each agency is responsible for service within its boundary area. None of the agencies reported providing services outside their respective territory.

7.2.2 - SERVICE AREA

Each agency is responsible for service within its boundary area. None of the agencies reported providing services outside their respective territory. Section 6.2.3 describes the drainage areas of each stormwater service provider in Alameda County.

7.2.3 - STATE WATER RESOURCE CONTROL BOARD STORMWATER PROGRAM

The California Water Boards have been focused for more than 20 years in the area of stormwater quality management and regulation. The State and Regional Water Boards continue to strive to ensure that surface and groundwater resources are protected and managed in a sustainable manner for future generations. Recent State legislation and increased awareness of stormwater-related environmental challenges and opportunities have contributed to continuously changing innovative approaches to stormwater management and regulation. In 2016, the State Water Board adopted its Stormwater Strategy to further develop innovative regulatory and management approaches to maximize opportunities to use stormwater as a resource (State Water Resource Control Board, 2020).

The Municipal Stormwater Program regulates stormwater discharges from municipal separate storm sewer systems (MS4s) throughout California. USEPA defines an MS4 as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) owned or operated by a state, city, town, village, or other public entity, which is designed or used to collect or convey stormwater, is not a combined sewer, and is not a part of a sewage treatment plant.

Pursuant to the Clean Water Act, stormwater permits are required for discharges from an MS4 serving a population of 100,000 or more. The Municipal Stormwater Program manages the Phase I Permit Program (serving municipalities over 100,000 people), the Phase II Permit Program (for municipalities less than 100,000), and the statewide stormwater permit for the State of California Department of Transportation. The SWRCB and RWQCB implement and enforce the Municipal Stormwater Program (State Water Resource Control Board, 2018).

7.2.4 - STORMWATER FACILITIES AND DRAINAGE AREAS

The City of Alameda has eight major drainage areas, all of which drain either by gravity or pump discharge into the waters surrounding Alameda Island and Bay Farm Island. There are four drainage subareas identified on Alameda Island and four on Bay Farm Island. Each subarea contains some combination of pipes, pumps, culverts, or outlets and lagoons. These facilities all eventually discharge into the waters surrounding Alameda and Bay Farm Islands (City of Alameda, 2008).

The City of Albany's stormwater drain system is a network of structures, channels, and underground pipes that feeds into the San Francisco Bay without treatment. There are approximately 11 miles of storm drain in the City, and there are five creeks that flow within and along Albany's city limits from the Berkeley Hills to the San Francisco Bay. The City of Albany employs the Clean Water Program, which is a federally mandated program comprised of both flood control and pollution abatement (City of Albany, 2016).

The majority of stormwater runoff in the City of Berkeley flows west to the San Francisco Bay, with a small portion of the City draining east to Wildcat Creek. There are 10 watersheds wholly or partially within the City. All non-urban runoff flows into the City from Strawberry Canyon and Claremont Canyon, east of the City. Natural creeks such as Codornices, Cerrito, Strawberry, and Temescal also provide a path for stormwater runoff to the San Francisco Bay (City of Berkeley, 2019).

The City of Dublin maintains inlet and pipes to transport stormwater runoff to several creeks (Alamo, Dublin, Tassajara, Koopman, Donjan, and Canyon) and through the flood control system. The City's Green Stormwater Infrastructure Plan allows for a natural and environmentally sustainable approach to managing stormwater runoff using specially designed landscaped areas, pervious surfaces, and rainwater capture (City of Dublin, 2019).

The City of Emeryville's surface runoff from the City flows through Temescal Creek or is collected in local storm drains and is discharged directly into the San Francisco Bay. The existing sanitary sewer system in the area is generally old and in poor condition. Although separate sanitary and storm sewer lines exist throughout the City, the lines run parallel to each other. Stormwater from the storm sewer lines can leak into the sanitary sewer lines, causing excessive infiltration into the sanitary sewer collection system (City of Emeryville, 2019).

The City of Fremont and the Alameda County Flood Control Water Control District manage the stormwater drainage system within the City. The City maintains the majority of the storm drainage system and ensures that adequate storm drainage facilities are built to support new development. The District also reviews development proposals and advises the City on appropriate measures. Alameda Creek, as well as all the creeks and channels that comprise the District drainage facilities, along with Lake Elizabeth, accommodate floodwater for purposes of stormwater management (City of Fremont, 2011).

In the City of Hayward, the major storm drainage facilities are owned and maintained by the ACFCWCD. The ACFCWCD also owns and operates a stormwater treatment pond in Hayward. Most of the infrastructure owned by Hayward are smaller pipes, less than 30 inches. The storm drain system consists of gravity pipelines, predominantly made of reinforced concrete, which discharge to underground storm drain lines or open channels owned by the ACFCWCD. The City of Hayward has five pump stations that pump stormwater into stormwater collection systems and/or dry creeks immediately downstream. Stormwater flows eventually drain into Mt. Eden Creek and Old Alameda Creek to San Francisco Bay (City of Hayward, 2015).

The City of Livermore is split into five drainage areas, the northeast, southwest, east downtown, and northwest. These facilities discharge into Arroyo Mocho, Arroyo Las Positas, and Arroyo Del Valle either directly or via smaller tributaries. The basins are organized around creeks and dividing structures, such as I-580. Stormwater flows through reinforced concrete pipes to major channels and detention basins and to creeks, including Arroyo Las Positas, Arroyo Mocho, Granada Channel, Cottonwood, Cayetano, and Altamont (City of Livermore, 2004).

The City of Newark is comprised of three different watersheds: the Newark Slough, Plummer Creek, and Mowry Slough watersheds. The three watersheds have tributaries that originate in the neighboring cities of Fremont and Union City, flow through the City of Newark, and eventually terminate in the San Francisco Bay. The Newark Slough watershed drains the flatlands of Newark and Fremont via a system of underground storm drains and engineered channels into Newark Slough and San Francisco Bay. The Plummer Creek watershed drains the urban flatlands into Plummer Creek and the South San Francisco Bay. Courtesy of the Alameda County Flood Control and Water Conservation District. The Mowry Slough watershed flows from the northeast edge of Fremont to Mowry Slough and southern San Francisco Bay. Courtesy of the Alameda County Flood Control and Water Conservation District (City of Newark, 2013).

The City of Oakland's storm drainage system consists of approximately 400 miles of storm drainpipes, 80 miles of open creeks and waterways, 18,000 structures, 11 pump stations, and other drainage appurtenances. Stormwater generally flows in a southwesterly direction, from the hills to the flatter lands of the City, and drains into larger bodies of water, including Lake Merritt, the Oakland Estuary, San Leandro Bay, and eventually, San Francisco Bay. There are eight main watersheds in Oakland that include the Temescal Creek watershed, the Glen Echo Creek, Trestle Glen Creek watershed, the 14th Avenue and San Antonio Creek watershed, the Pleasant Valley Creek watershed, the Peralta Creek, Courtland Creek, and

Seminary Creek watershed, the Lion Creek watershed, the Arroyo Viejo Creek watershed, and the San Leandro Creek watershed (City of Oakland, 2006).

There are five creeks located within Piedmont: Pleasant Valley Creek, Bushy Dell Creek, Wildwood Creek, Indian Gulch, and Glen Echo Creek. These five creeks and the land areas that drain into them from watersheds that empty into Lake Merrit in Oakland and from there into the San Francisco Bay. Due to the fact that the City is built out, there is a significant amount of impervious surface area preventing stormwater from reaching the soil. Instead, stormwater flows over impervious surfaces and enters the storm sewer system, which flows untreated to creeks and the Bay (City of Piedmont, 2019).

The City of Pleasanton's storm drainage systems consists of underground pipes, local channels, and natural swales in a hillside. These facilities carry water runoff within the drainage basin to the flood-control channels (known locally as arroyos). According to the Pleasanton General Plan, the City will continue to require that new developments install appropriately sized storm drains. According to the City's Urban Water Management Plan, the City does not implement any stormwater recovery systems. The City's drainage system drains to creeks and channels, including Arroyo de la Laguna, Arroyo Del Valle, Arroyo Mocha Canal, Pleasanton Canal, Alamo Canal, Laurel Creek, and Tassajara Creek (City of Pleasanton, 2016).

The City of San Leandro maintains storm sewers within city limits, including 2,600 inlets. All stormwater inlets are inspected and cleaned annually, and the City maintains 24-hour on-call services for issues related to stormwater overflows. Estudillo Canal, Corvalis Canal, San Leandro Creek, and San Lorenzo Creek carry water to the San Francisco Bay (City of San Leandro, 2015).

Union City sits in an alluvial plain adjacent to San Francisco Bay. Union City uses storm drains, pipes, and channels to drain to Alameda Creek, Dry Creek, and to the San Francisco Bay. The City's stormwater collection service is provided for and maintained by City departments. In general, City streets include storm drainage facilities, except for a few steeply sloped streets in the hills east of Mission Boulevard. No major improvements or expansions are planned (City of Union City, 2002).

The Alameda County Flood Control District and the County Public Works Department manage the storm drains, which flow to the flood control system. Stormwater flows down from Castro Valley and the Hayward Hills to storm drains, channels, and pipelines leading to San Lorenzo Creek and on to San Francisco Bay. Sulphur Creek and the Estudillo and Bockman Canals also flow to San Francisco Bay. The District owns and manages most storm drains in Castro Valley, located in Flood Control Zone 2. Within Zone 2, there are 81 miles of natural creek, five miles of earth channel, 12 miles of concrete channel, two miles of improved channel, 44 miles of underground pipe, and two pump stations. In addition, there are two reservoirs, Cull Canyon and Don Castro, which are maintained for flood control.

The Five Canyons CSA reimburses the Alameda County Public Works Department for as-needed services to provide stormwater services. Stormwater treatment services are not

provided by the County. The CSA has stormwater services, including pipes and channels. Natural creeks are also critical components of the drainage infrastructure. However, stormwater flows into San Lorenzo Creek (Alameda LAFCO, 2012).

7.3 - Service Demand

This section discusses the factors affecting service demand, such as precipitation, impervious surfaces, permits, and the regulatory environment. Section 2 provides the residential population and job base in each agency, projected population and job growth rates, and a description of growth areas.

7.3.1 - PRECIPITATION

A major driving factor affecting the capacity and utilization of stormwater facilities in Alameda County is the rate of precipitation. While precipitation amounts cannot be controlled, proper facilities can be managed when service needs can be determined upon annual rainfall amounts and seasonal heavy rainfalls.

7.3.2 - IMPERVIOUS SURFACES

Rainwater is typically dispersed by percolation into either retention within the soil, onsite drainage/design system, or runoff into local creeks, feeding rivers and so on into the ocean or Delta. The amount of rainwater percolation is decreased when there is a high concentration of impervious surfaces. Impervious surfaces are mainly artificial structures such as pavements, roads, sidewalks, driveways, and parking lots, as well as industrial areas such as airports, ports, and logistics and distribution centers that are covered by impenetrable materials such as asphalt, concrete, brick, stone, and rooftops. Soils compacted by urban development are also highly impervious.

Stormwater runoff is the product of rainfall when it meets impervious surfaces. Stormwater runoff can be reduced by watershed management and green stormwater infrastructure techniques and materials. Development standards and best management practices may reduce future stormwater runoff caused by new development or minimize environmental impacts.

7.3.3 - REGULATORY ENVIRONMENT

Stormwater service needs are also affected by pollutant loads in stormwater runoff and emerging regulatory requirements, including total maximum daily load requirements, for reducing pollutants to the maximum extent practicable.

7.3.4 - PERMIT MONITORING

Watersheds in the County have impaired water quality or are tributary to impaired waters such as the San Francisco Bay. Various watersheds are subject to total maximum daily loads (TMDLs) for mercury, PCBs, and pesticides. Compliance with TMDLs and applicable

stormwater permits was a major driver informing the selection, evaluation, and prioritization of SWRP projects (State Water Resource Control Board, 2018).

Watersheds within Alameda County drain to the San Francisco Bay and are regulated by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). ACCWP member agencies are permitted subject to the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) permit (Order No. R2-2015-0049). This stormwater permit is commonly known as the Municipal Regional Permit.

The types of industry subject to NPDES permits include concentrated animal feeding operations and aquatic animal production facilities, manufacturing, mining, silvicultural operations, trailer parks, service stations, laundromats, and stormwater discharges associated with industrial activity.

Stormwater service providers in Alameda County have conducted stormwater monitoring at NPDES permit sites and other potential industrial and commercial sources of runoff. Stormwater permits require cities and other permittees to implement programs that minimize the negative impacts of construction, industrial, and commercial activities on municipal stormwater quality. This is a parallel and separate effort from the statewide construction and industrial permits issued by the SWRCB (State Water Resources Control Board, 2018).

NPDES permits are most numerous in Hayward, where large amounts of development are occurring, similar to Livermore, Oakland, and Pleasanton. Alameda and Oakland have the most violations and enforcement actions within five years.

7.3.5 - PROJECTED DEMAND

Over the next 15 years, stormwater service demand will likely increase to keep pace with growth in development (impervious areas) and regulatory requirements. Factors that affect stormwater service demand include the amount of rainfall, new development of storm drains and other stormwater infrastructure, development controls, as well as increased commercial and industrial growth necessitating more NPDES permits and discharge monitoring.

7.4 - Infrastructure Needs or Deficiencies

In the context of stormwater service, infrastructure needs signify facilities that do not provide adequate capacity to accommodate current or projected demand for service for the region as a whole or for jurisdictions within the County.

7.4.1 - INFRASTRUCTURE CONDITIONS

The infrastructure used to provide stormwater services includes storm drains, catch basins, channels and natural waterways, pump stations, pipes, and ditches. Infrastructure deficiency

is often determined when using a projected five-year or 10-year storm event, so the system will have adequate capacity in the event there is a large storm event.

Each of the cities and the County maintain its own system of storm drains, underground pipes, and local channels, which eventually flow to the County flood control system or directly into San Francisco Bay. In some cities, catch basins and lagoons are used to regulate flow and pollution. The cities are responsible for the maintenance of their own facilities. All the cities regularly inspect and clean their stormwater infrastructure, but some cities are less active at this than others due to financial constraints. The ACFWCD is responsible for its facilities within each city.

While most cities have facilities that are in fair to good condition, some cities such as Berkeley, Emeryville, and Oakland have systems that are either very old or cannot handle the necessary capacity (see Table 7-2). The four cities not served by ACFWCD or Zone 7 drain stormwater into the San Francisco Bay. Three cities drain directly into the Bay, and Piedmont drains indirectly via Oakland.

**Table 7-2
Stormwater Infrastructure Needs and Deficiencies**

Provider	Facility needs and deficiencies
Alameda	Storm drainage piping extension/capacity improvements, new storm drains, and pump station capacity improvements for several areas, including the Alameda and Bay Farm Islands, due to flooding in areas that lack capacity.
Albany	Currently adequate; however, the system will require continued measures to reduce water pollution and maintenance/upgrades to handle an increase in flows.
Berkeley	Most of the system is over 80 years old. Projects in the backlog include rehabilitation of piping reaches, elimination of rising groundwater flooding issues, replacement of deteriorated drain inlets, major cleaning of the primary storm collectors in the lower Berkeley drainage watersheds, and replacement of cross drains. In 2011, the total unfunded capital needs of the stormwater system exceeded \$208 million.
Dublin	None
Emeryville	The stormwater system is not connected to the wastewater system, but since they run parallel, stormwater can leak into poor condition wastewater pipes, causing I/I.
Hayward	Several pipes will need to be upsized to increase capacity and diversion measures for predicted overflows.
Livermore	Need improvements for localized flooding for each drainage region, except the downtown region, maintenance on channels, and erosion control of Arroyo Mocho.
Newark	Lindsay Tract storm drain improvements, installation of full trash capture devices citywide, and Crystal Springs storm drain pump repairs.
Oakland	Many of the storm drainage assets are over 80 years old and are at or reaching the end of their serviceable life and will need to be repaired or replaced.
Piedmont	None identified
Pleasanton	None identified
San Leandro	None identified
Union City	None identified
Five Canyons CSA	None identified
County Area	Identify, replace, or repair facilities within the Castro Valley area.

Source: Alameda Sewer drain Master Plan, City of Albany General Plan 2035, City of Berkeley Green Infrastructure Plan 2019, City of Dublin General Plan, City of Emeryville General Plan 2019, City of Hayward City of Newark CIP 2018–2020, State Water Resource Control Board, Region 2: San Francisco

7.5 - Service Standards and Adequacy

There are several types of measures that can be used to measure stormwater service providers' adequacy in an agency's ability to meet regulatory standards set by the State Water Resource Control Board (SWRCB). Total maximum daily loads (TMDLs) and stormwater discharge policies, meeting performance standards, implementation of source control and pollution programs, response times, service challenges, localized ponding, and storm drain back-up, can measure the adequacy of the level of service provided.

The Federal Clean Water Act (CWA) contains two strategies for managing water quality. One, a technology-based approach that envisions requirements to maintain a minimum level of pollutant management using the best available technology, was the great innovation of the 1972 Act. The other, a water quality-based approach, relies on evaluating the condition of surface waters and setting limitations on the amount of pollution that the water can be exposed to without adversely affecting the beneficial uses of those waters. A TMDL must account for all sources of the pollutants that caused the water to be listed. Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (federally permitted discharges) and contributions from nonpoint sources. USEPA is required to review and approve the list of impaired waters and each TMDL (State Water Resources Control Board, 2018).

TMDLs are established at the level necessary to implement the applicable water quality standards. A TMDL requires that all sources of pollution and all aspects of a watershed's drainage system be reviewed, not just the pollution coming from discrete conveyances (known as point sources), such as a discharge pipe from a factory or a sewage treatment plant. Stormwater can be considered a nonpoint source polluter.

TMDLs for Alameda County are developed either by San Francisco RWQCB or by USEPA. TMDLs must consider and include allocations to both point sources and nonpoint sources of listed pollutants. In 1997, the San Francisco RWQCB approved a countywide municipal stormwater NPDES permit for the 14 cities, the County, ACFWCD, and Zone 7. The permit identifies mercury, copper, pesticides, PCBs, and sediment to be specific pollutants of concern and requires the permittees to protect the San Francisco Bay by reducing pollutants in stormwater runoff to "the maximum extent practicable." Although the permit does not establish precise numeric definitions of acceptable effluent levels, it requires the parties to adopt policies to control and abate the pollutants of concern.

7.5.1 - TMDL REQUIREMENTS

ACCWP's Stormwater Quality Management Plan establishes requirements for the cities, the County, and ACFWCD to reduce or control mercury loads and identifies actions necessary to better understand and control methylmercury production.

The most relevant cause of mercury traces in the San Francisco Bay is its historical use in amalgamating gold. Fish consumption is the major source of human mercury exposure in the U.S. As a result of high mercury levels in the San Francisco Bay, the Office of Environmental

Health Hazard Assessment has adopted a fish consumption advisory not to consume more than two meals per month of sport fish from the San Francisco Bay. To achieve reductions in mercury levels, ACCWP is working with the municipalities, the Alameda County Resource Conservation District, the EPA, and the public to reduce mercury directly and to study methods to reduce mercury concentrations. Such methods include source control and pollution prevention activities, including fluorescent light bulbs, electrical switches, and thermometer collection and disposal programs, and other household hazardous waste collection programs (State Water Resource Control Board, 2018). Urban stormwater mercury loads can also be reduced through capture, detention, and removal of highly contaminated sediment, and possibly via urban stormwater treatment.

Mercury levels in the San Francisco Bay have been decreasing since RWQCB began its monitoring and are expected to continue decreasing. The mercury in the Bay is believed to originate in the Central Valley and enter the Bay via the Bay-Delta. It is unknown whether mercury loads are increasing or decreasing within Alameda County because monitoring information specific to Alameda County is not yet available.

The stormwater service providers are responsible for inspecting all potential non-residential dischargers. Table 7-3 shows the active NPDES discharge permits in each jurisdiction offering stormwater services and the number of enforcement actions and violations within the last five years.

**Table 7-3
Current Discharge Permits per Agency**

Provider	Total NPDES permits	Enforcement Actions within 5 years	Violations within 5 years
Alameda	3	4	12
Albany	1	1	0
Berkeley	2	1	0
Dublin	2	1	1
Emeryville	1	1	0
Hayward	5	0	0
Livermore	4	0	0
Newark	N/A	N/A	N/A
Oakland	4	5	11
Piedmont	1	1	0
Pleasanton	4	2	1
San Leandro	1	0	0
Union City	3	0	1
Five Canyons CSA	0	0	0
County Area	0	0	0

Source: State Water Resource Control Board, Region 2: San Francisco

7.5.2 - STORMWATER DISCHARGE REQUIREMENTS

The SWRCB issued countywide municipal stormwater permits in the early 1990s to operators of municipal separate storm sewer systems serving populations over 100,000, although every stormwater service provider in Alameda County has submitted an annual report to the RWCQB. The first regional MRP was approved in 2009. On November 19, 2015, the SWRCB reissued these countywide municipal stormwater permits as one Municipal Regional Stormwater NPDES permit to regulate stormwater discharges from municipalities and local agencies in Alameda, Contra Costa, San Mateo, and Santa Clara counties, and the cities of Fairfield, Suisun City, and Vallejo (State Water Resource Control Board, 2020).

Each agencies' annual report is comprised of three parts: regional, countywide, and individual. Some requirements of the Municipal Regional Stormwater National Pollutant Discharge Elimination System Permit (MRP) are being implemented by the Bay Area Stormwater Management Agencies Association (BASMAA) on behalf of all the MRP permittees. Other elements are being implemented collaboratively by the agencies through their respective countywide programs. As such, BASMAA and the countywide programs have submitted annual report elements on the regional and countywide collaborative tasks, respectively, on behalf of the MRP agencies. The individual MRP permittees have also submitted annual report elements on the permit provisions they have implemented individually.

SWRCB's review of the ACCWP FY 2017-2018 Annual Report mentioned that Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City are considered member agencies of the ACCWP, along with Alameda County Flood and Water Conservation District, and Zone 7 Water Agency. The County of Alameda has also adopted a polystyrene ban that applies to the unincorporated area of the County (Alameda Countywide Clean Water Program, 2018).

The Department of Environmental Health developed a formal agreement with the Public Works Agency to implement the industrial and commercial component of the ACCWP Stormwater Management Plan for unincorporated Alameda County. The program includes inspection of facilities for compliance with the clean water regulations, provide outreach and education of best management practices to business owners, follow-up inspection for enforcement action, and create and maintain a database of businesses in Alameda County's unincorporated area for the Clean Water Program (Alameda Countywide Clean Water Program, 2018).

7.5.3 - PERFORMANCE STANDARDS

ACCWP outlines various performance standards in its Stormwater Quality Management Plan (SQMP) for July 2001 to June 2008 that implement State and federal requirements as well as develop local standards of stormwater pollution control (Alameda Countywide Clean Water Program, 2003).

BMPs

The SQMP from the ACCWP depicts BMPs for dealing with all types of stormwater pollution and sets standards for how municipalities and agencies should perform. The following are BMP categories depicted in the SQMP:

- Public information and participation
 - Evaluation of BMPs
 - Coordination with BASMAA
- Municipal maintenance activities
 - Street Cleaning
- New development and construction controls
- Industrial and commercial discharge controls
- Illicit discharge controls

Table 7-4 references each agency’s performance with respect to BMPs in areas that are of concern from the RWQCB. Every jurisdiction provides public information and municipal maintenance, although several agencies could make improvements in the area of new development and construction controls. The majority of stormwater service providers utilize/are compliant with the BMPs and program goals depicted in the SQMP; however, Alameda, Berkeley, Dublin, Fremont, Newark, Oakland, San Leandro, Union City, and Alameda County have been previously identified as non-compliant.

**Table 7-4
Stormwater Regulatory Performance**

Agency	Public Information	Municipal Maintenance	Construction Controls	Illicit Discharge	Industrial and Commercial
Alameda	X	X	O	X	X
Albany	X	X	X	X	X
Berkeley	X	X	X	X	O
Dublin	X	X	X	X	X
Emeryville	X	X	X	X	X
Fremont	X	X	O	X	X
Hayward	X	X	X	X	X
Livermore	X	X	X	X	X
Newark	X	X	O	X	X
Oakland	X	X	O	X	X
Piedmont	X	X	X	X	X
Pleasanton	X	X	X	X	X
San Leandro	X	X	O	X	X
Union City	X	X	O	X	X
County Area	X	X	O	X	X

Notes: Compliant = X, Non-Compliant = O

Source: Fiscal Year 2017/2018 Annual Report of Stormwater Program Implementation

PUBLIC INFORMATION AND PARTICIPATION

The public information program BMPs have been enacted by all parties to the NPDES permit for Alameda County. Specific programs may include, but are not limited to, anti-pollution education campaigns, partnering with watershed stewardship groups, and support of restoration activities (California State Water Resource Control Board, 2018). Typically, outreach campaigns are conducted with the countywide outreach campaign.

INDUSTRIAL AND COMMERCIAL DISCHARGE CONTROLS

Each municipality is required to monitor the individual industrial and commercial permit holders within their jurisdiction. Specific BMPs have been developed for how and when inspections take place. Each agency is to develop or reinstate a five-year industrial and commercial business inspection plan to outline how inspection requirements will be met.

ILLICIT DISCHARGE CONTROLS

Each agency is responsible for providing an inspection program to curb illegal discharges, and BMPs have been developed to perform this activity effectively. The goal for agencies is to inspect high-priority areas at least once per year and survey each agency's entire drainage area within a five-year period.

All service providers have illicit discharge programs that track problems and monitor the storm drainage system. Other activities performed by agencies under the illicit discharge control program include mercury thermometer exchange programs, distribution of mercury lamp fact sheets, an inspection of high-priority areas along channels or at catch basins at least once per year, and response to public reports or complaints.

MUNICIPAL MAINTENANCE ACTIVITIES

Cities and agencies can reduce the amount of polluted stormwater runoff through proper maintenance and procedures. The BMPs outlined for municipal maintenance include proper street sweeping, efficient spill response and cleanup, maintenance of storm drains and watercourses, and the proper use of chemicals and petroleum products in all municipal activities.

All the cities have active street sweeping, storm drain inspection, and litter control programs as required by the NPDES permit and monitor these activities through performance tracking. Trash collection has been a priority for all cities, and significant resources are utilized to comply with the 100 percent reduction in trash going into the Bay

NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

Typically, a significant amount of pollution originates from new developments and construction sites during storms. Specific BMPs have been enacted to curb this influx of pollutants into the stormwater system. All new construction and areas of significant redevelopment are required to implement BMPs to manage stormwater pollution. These

BMPs are designed not only to reduce the amount of pollution entering the stormwater system but also aim to mitigate the effects of further urbanization by reducing runoff and implementing onsite treatment methods for runoff. The BMPs require cities and agencies to increase plan checking and inspection of new developments and construction sites. In previous years, most agencies were lacking in reporting source controls, although it is required that agencies include any discharge reports in their annual reports. Areas for improvement include greater reporting of source controls, the discontinuing of ineffective controls, implementation of controls on all projects, greater education efforts on construction-specific BMPs, increased clarity in reporting measures, as well as greater cooperation in developing new BMPs in moderate to high-density growth areas. All the cities and unincorporated areas of the County have met the performance standards for new development, redevelopment, and construction BMPs.

City of Alameda

Inspections were performed at all the sites and reported on an at-least monthly basis during the months that the respective sites were active during the period October 2017 through April 2018. For all the sites that had disturbed an acre or more of soil, the City has required and received verification of coverage under the State's Construction General Stormwater NPDES permit (No. CAS000002). The City did not perform any inspections at sites that did not disturb one acre or more of soil or were not otherwise characterized as a High Priority Site.

City of Berkeley

Two violations cited by inspectors during 2017-2018 were both related to sediment control. This is consistent with previous years. Typical issues included insufficient maintenance of sediment control devices and inadequate sweeping. Excluding those addressed by verbal warnings, inspectors cited only one violation during 110 inspections conducted in FY 17-18 (one percent of all inspections). This percentage is similar to FY 16-17 (one percent of all inspections) and FY 15-16 (one percent of all inspections). Construction inspection staff were trained on the updated ERP in FY 17-18.

City of Dublin

In the City of Dublin, during FY 2017-2018, three construction inspectors conducted a total of 198 construction inspections. The City inspects all construction sites, including those sites that disturb less than one acre. In FY 2017-2018, there were no construction sites that were less than an acre which were designated as a High Priority Site. In FY 17-18, City of Dublin construction inspectors conducted 198 inspections at 40 sites using the Clean Water Program inspection checklist. Of the sites inspected, there were 19 enforcement actions taken, which included eight verbal warnings and 11 written warnings. The main issues encountered in FY 17-18 revolved around materials and waste management. Uncovered stockpiles and improper storage were the predominant reasons for enforcement actions. Prior to the start of the rainy season, all construction inspectors receive refresher training on the construction inspection program and the City's enforcement response plan.

City of Fremont

In the City of Fremont, 59 sites disturbing one acre or more of soil were inspected during 17-18. This is an increase of 44 percent over the 41 such projects inspected during FY 16-17. Four out of the 59 sites have not started construction but have an active NOI. The City designated one new High Priority Site and four new Hillside Sites in FY 17-18, adding to the previous two High Priority Sites in FY 16-17 and adding four Hillside Sites. Two of the four Hillside Sites have not started construction but have issued building/grading permits. The 522 total construction site stormwater inspections conducted during FY 17-18 represent a 39 percent increase over the 375 inspections conducted during FY 16-17. Forty-eight of the 522 inspections were conducted to verify if the site had begun construction/demolition. There have been 24 instances of illicit discharges reported.

The City has a thorough construction site stormwater inspection program, as evidenced by the 522 inspections conducted at 66 sites (including 61 NOI sites and three High Priority Sites and four Hillside Sites) throughout the past reporting period. Seven projects only required one inspection a month to verify if construction had started (sites over an acre and Hillside project construction permit holders); excluding these, an average of eight inspections were conducted per project. All construction projects disturbing at least one acre of soil, projects designated as High Priority Sites, and Hillside Sites are inspected at least once a month throughout the rainy season, with re-inspections conducted as necessary to ensure that all construction site violations are corrected in a timely manner.

City of Hayward

The City of Hayward continues to encounter private development proposed within its jurisdiction. The BMPs that the City of Hayward utilizes excel at mitigating any negative effects of development. As development is proposed, the City sees a mix of small and large developers. In recent years, it has been a trend that smaller developers need consistent oversight when implementing BMPs when compared to projects being developed by larger developers. Most oversight notices recorded were to maintain stabilized construction entrances and to keep streets free of silt and/or tracking.

City of Oakland

In the City of Oakland, the City conducted 653 inspections at 158 sites in FY 2017-2018. Inspectors worked to ensure that adequate controls were in place to minimize illicit discharges. Where inspectors identified violations of the City's stormwater ordinance, 98 percent of enforcement actions were addressed within 10 days. Inspectors make an effort to conduct follow-up inspections, to require corrections during the inspection, or to require the construction contractor to provide evidence that the corrections were made within 10 days. Inspectors needed more time (between 11 and 30 days) to work with construction contractors to address violations at three sites (two percent of the total enforcement actions). The types of violations encountered by inspectors were similar to prior years, with 48 percent of discrete violations due to site management issues and 36 percent of discrete

violations due to sediment control issues. Combined, the two categories accounted for 84 percent of all violations.

City of Newark

In the City of Newark, there were a total of 27 sediment control measure enforcement actions, 28 site management enforcement actions, one erosion control enforcement action, and two non-stormwater-related enforcement actions. Sediment control measures and good site management both received the most violations. For the FY 17-18 reporting period, the amount of enforcement actions has decreased, which is a good indication that contractors are paying more attention to stormwater protection-related issues during construction. The City had zero illicit discharges related to construction activity during the FY 17-18.

The City's construction inspection program has not changed from the previous reporting period. Monthly inspections are performed for High Priority Sites, sites that disturb more than one acre, and projects that require the review and approval of a grading and drainage plan. The City did not have any Hillside Sites or High Priority Sites during this reporting period. The City continues to use the current inspection checklist for construction stormwater controls provided by the Alameda Countywide Clean Water Program for all construction inspections. For the FY 17-18 reporting period, the City included supplemental pictures and educational materials attached to the inspection checklist.

City of San Leandro

In the City of San Leandro, verbal warnings were effective in resolving the enforcement actions. No enforcement actions were reported in the prior year, so the data suggests that rigorous inspection efforts have been effective in assuring compliance.

- Revised operating procedures and provided training to inspectors.
- Conducted inspections with the new forms.
- Participated in the countywide program's committees/work groups.

City of Union City

In Union City, third-party companies were hired by the developer to conduct stormwater inspections. These inspections are submitted to the City on a monthly basis and reviewed for non-compliance. In the event of non-compliance, enforcement actions are issued. Inspectors inform third-party companies what to look for to ensure that the inspectors are able to effectively inspect their respective jobs.

The City's inspectors ensure BMPs are installed correctly and maintained throughout the construction phase of all projects that could potentially have a detrimental effect on water quality. Private construction projects can have third-party companies conduct stormwater inspections and enforce BMPs. The City inspectors will still visit the project site and be in contact with the third party performing inspections.

Alameda County Flood Control District

In Alameda County, a total of 13 inspections were conducted at three sites in the Flood Control District during the reporting period (2017-2018). No violations were noted. Currently, the Stormwater Compliance Program is very effective and running smoothly. The District has participated in the countywide program’s subcommittee/work groups for BMP training.

7.5.4 - ANNUAL MONITORING REPORTS

The ACCWP’s FY 2018–2019 has been satisfactory in summary reporting on monitoring efforts outlined in provision C.8: Water Quality Monitoring (ACCWP, 2017).

7.5.5 - SOURCE CONTROL AND POLLUTION PREVENTION PROGRAMS

As discussed previously, the ACCWP coordinates several countywide efforts on source control as well as public education campaigns. In addition, at the City level, the agencies administer various pollution prevention programs. All agencies maintain illegal dumping prevention programs, some of which are stencils of “no dumping” on storm drains and public information and outreach. Illegal dumping enforcement is carried out through local agency responses to spills and reports of illegal dumping.

7.5.6 - BENCHMARK INDICATORS

In addition to meeting regulatory requirements, stormwater adequacy can be measured by a review of response time for storm drain and pipe blockages, inspection, and cleaning rates. Information on these is shown in Table 7-5.

The City of Fremont has the highest rate of discharge reports of the municipal stormwater service providers. This also indicates that Fremont has the highest number of discharges reaching storm drains and/or receiving waters. In addition, the City of Livermore has a moderate to a high number of discharges (30); however, it was recorded that all of the discharges affected storm drains and/or receiving waters.

Street sweeping frequency varies between agencies. According to the frequency of each agency’s street sweeping program, you can surmise that an agency with a higher frequency will have more material on average to remove in order to reduce storm drainage issues. The City of Alameda has a robust street cleaning schedule and approximates that it sweeps entire service areas at least once a week.

**Table 7-5
Stormwater Benchmark Indicators**

Agency	Discharges Report	Discharges reaching storm drains and/or receiving waters	Discharges resolved in a timely manner	Street Sweeping Rate
Alameda	64	13	60	At least weekly
Albany	12	5	5	Approx. monthly
Berkeley	23	6	23	Monthly
Dublin	20	12	18	Twice a month
Emeryville	3	0	3	N/A
Fremont	125	40	124	Monthly
Hayward	31	4	31	Every two weeks
Livermore	30	30	30	Monthly
Newark	9	5	4	Once a month
Oakland	35	13	13	Varied
Piedmont	1	0	1	Monthly
Pleasanton	15	14	15	Monthly
San Leandro	21	4	20	Monthly
Union City	16	9	15	N/A
Five Canyons CSA				N/A
County Areas				4 to 6 weeks

Source: 2017-2018 Annual Reports for the Municipal Regional Stormwater NPDES permit database, City of Alameda Public Works, City of Albany Public Works, City of Berkeley Public Works, City of Dublin Public Works, City of Emeryville Maintenance Services, City of Hayward Street Sweep, City of Livermore Public Works, City of Newark PW, City of Piedmont PW, City of Pleasanton PW, City of San Leandro PW, City of Union City PW, ACFCWD

City of Alameda

City personnel respond to all complaints, observations, and reports of illicit discharges, including those from private property, in the public right of way, along the shoreline and/or from mobile business locations in a manner consistent with Provision C5 and the City’s Stormwater Program Enforcement Response Plan.

In addition to the 64 reported discharge incidents indicated in the table above, there were an additional 12 reports during this reporting period where field response did not substantiate any evidence of an actual and/or potential pollutant discharge at the location, to the public right of way, and/or to a storm drain inlet or receiving waters. There was no summary accounting for “resolved or unresolved in a timely manner” for these 12 unsubstantiated or non-discharge issues. Of the 13 discharge incidents that resulted in pollutants reaching a storm drain inlet and/or receiving waters, in 12 of these incidents the discharges were immediately ceased, areas immediately cleaned up and/or mitigated by response teams, and/or immediate enforcement action was taken. One incident was not resolved in a timely manner. Educational outreach and enforcement actions (consistent with Alameda’s Emergency Response Plan) were also implemented when there were known responsible parties.

City of Albany

The Albany Fire Department (AFD) receives complaints for spills and illicit discharges. There were 12 reported incidents during the reporting period. AFD responds to complaints of illicit discharges immediately and controls the spill/discharge promptly with absorbent where applicable. Some spills were prevented from reaching the drains by using dikes/dams until absorbent could be applied. The AFD's incident report will note what measures were deployed. Most of the illicit discharges came from leaking automobiles and water main breaks. AFD reports unsubstantiated calls as false alarms, and so they would not be counted in the reports.

City of Berkeley

Discharges that are prevented from reaching storm drains/receiving waters are included in the total number of discharges reported. All efforts are made to prevent spills from reaching storm drains and/or receiving waters. In FY 17-18, all reported discharges were resolved in a timely manner.

City of Dublin

Spills and discharge complaints are managed by the Environmental Services Division in the Public Works Department. The Spill and Discharge Response Plan (SDRP) lists the protocol for responding to spills, and staff that may respond to spills have been trained in spill response. The SDRP includes the urban runoff & incidence response form, spill incident notification list, a list of vendors that may be used to clean up spills, an excerpt of the Enforcement Response Plan, and the Public Works Department emergency callout list. The SDRP is located on the intranet, so any staff person who answers a call or responds to a call-out can easily access the information.

The Environmental Coordinator maintains a file of all the spill and discharge responses for the year. The file includes actual discharges in addition to discharge reports for incidents that were unsubstantiated in the field. The urban runoff & incidence response form is completed for all incidents and tracks the actions that were taken for each response.

City of Emeryville

Emeryville staff were alerted to three potential incidents: a paint spill from a custodian's vehicle, which the City was able to contain and clean up before it reached any storm drain inlets; and a reported fueling spill and a separate sanding/painting operation at a private marina, which were investigated by Marina and City staff but not detected.

City of Fremont

City of Fremont Environmental Services Inspectors respond to citizen complaints and conditions observed in the field, follow up on substantiated complaints, and enforce violations, as necessary. All complaints are logged into the City database and verified with

field visits. In some of the cases, the immediate discharge/dumping problem is resolved promptly, yet the ultimate resolution of the case could require actions (e.g., installing a new trash enclosure) that take a longer period of time to implement.

City of Fremont Fire Department 9-1-1 log sheets are used for reporting emergency calls related to spills and discharges within the city limits and when assisting Caltrans or the CHP on freeways/highways. Reported discharges include 57 vehicle fluid spills due to a collision or road hazard (48 on City streets and nine Caltrans rights of way).

Union Sanitary District (USD) inspectors under contract with the City of Fremont use iPACS to document illicit discharges and track priority areas. The database serves two functions: (1) it creates a record of the discharge, and (2) it notifies the illicit discharge inspector of the discharge via a paging/email system. USD staff and City departments (e.g., Environmental Services, Hazmat, Fire, and Maintenance) have access to the database. Reported discharges from USD include five discharges that were prevented from entering a storm drain and/or receiving water. On one reported complaint, there was nothing found to abate.

City of Hayward

Discharges or spills detected by Street Maintenance staff during annual inspection and cleaning of storm drain catch basins are reported to and followed up on by inspectors. In addition, inspectors are trained to note and report discharges whenever they are in the field, and many commercial and industrial areas have an ongoing review from staff presence there. In addition to published phone numbers and email addresses to report spills, complaints are also forwarded via messages entered in the City's online Access Hayward Constituent Relationship Management (CRM) system. The City's illicit discharge database includes a section to record materials reported and actual materials found in the field. The report form contains fields that indicate if a reported illicit discharge was not found or is exempt from stormwater regulations. Inspection staff stock granular absorbent in their vehicles and deploy it as necessary upon their arrival to prevent or abate discharges that may reach the storm drain. Almost all discharges are abated prior to reaching receiving waters.

City of Livermore

The discharge data listed in the table above is reporting discharges that reached storm drain or storm gutter. No discharges reached actual receiving waters. The City issues 13 verbal notices, three warning notices, and five notices of violation during this reporting period.

City of Newark

Newark's Illicit Discharge Complaint and Response Program is implemented through the Public Works Department - Engineering Division. If the discharge flows beyond the storm drain system into nearby channels or creeks, the Alameda County Flood Control District and the Department of Fish and Game (if necessary) are contacted. City staff will remain on the site until cleanup operations are under control and the site is safe/clean for public access.

Additional follow-up visits are typically made to ensure that all required measures are in place and that the discharge will not occur again.

Discharges that are unsubstantiated and called in by a resident and/or other public/private agency are documented, nearby storm drain structures, channels, and creeks are inspected, and the responsible party is notified either verbally or in writing depending on the type and severity of discharge. The City will implement the Enforcement Response Plan to achieve timely and effective abatement of the illicit discharge. The City may also seek assistance from the Alameda County District Attorney's Office if the proper measures are not implemented in a timely/effective matter or if the responsible party appears to be uncooperative.

Five of the nine discharges were not "resolved" in a timely manner because a majority of the discharge entered the storm drain system before the City could implement the proper controls. "Unresolved" discharges during FY 2017-2018 were related to cooking oil spills, washing machine water discharges, bus wash water discharges, and sanitary sewer cleanout/overflow discharges.

City of Oakland

Discharge inspections and enforcement of incidents and field-identified issues are performed by inspections staff. The City also conducts inspections of survey and screening point locations (creeks and flood control channels) to enhance the storm collections system screening program. The City continues to maintain a variety of stormwater infrastructure types so that the function of the stormwater infrastructure operates at an adequate level.

During FY 2017-2018, approximately 35 unique illicit discharges were reported in the City. The 35 illicit discharge incidents are summarized below:

- Five allowed discharges
- Ten unsubstantiated cases
- Seven potential illicit discharges
- Thirteen actual illicit discharges

Allowed discharges include, but are not limited to, property drainage system and exempt discharges. Unsubstantiated cases are cases that have been responded to but were not found and/or located in the field. Unresolved discharge cases are discharges that are responded to and observed; however, no source is identified during the site visit. Potential illicit discharges are discharges to the street or sidewalk, but no discharge to the storm drain system or nearby receiving water totaled seven incidents. These illicit discharge cases were either resolved or abated/cleaned up immediately or prior to 10 business days and prior to any subsequent rain events. Actual illicit discharges are discharges that have the potential to access the storm drain system or nearby receiving water. These discharges were either resolved or abated/cleaned up immediately or prior to 10 business days and prior to any subsequent rain events.

Furthermore, the Oakland Fire Department Hazardous Materials Response Team responds to reported discharges and prioritizes by the type and/or volume of material discharged and the location of the discharge (e.g., discharges close to highly sensitive areas). Discharges to storm drains and/or receiving waters are prioritized as a top priority for immediate response.

City of Piedmont

The City of Piedmont does not receive many illicit discharge responses when compared to neighboring cities. As mentioned in Table 7-5, the City had one illicit discharge according to the 2017–2018 Stormwater Program Implementation, which did not contaminate the stormwater system. Furthermore, the City monitors and services 15 capture devices throughout the City. The City has also participated in a countywide program coordinating in the BASMAA Municipal Operation Committee.

City of Pleasanton

The City of Pleasanton Utilities Division responds to all complaints and all conditions observed and/or reported in the field regarding illicit discharges. All complaints are logged into the City's Maintenance Management System (CMMS). The Environmental Services Division staff document potential and actual discharge violations and require that the responsible parties' complete remedial actions in a timely manner. Staff also educate the responsible parties by providing BMP materials that are specific to the violation and on the importance of protecting waterways and the stormwater conveyance system. All illicit discharge complaints are recorded on the complaint/spill/discharge tracking spreadsheet. The City of Pleasanton does not differentiate between illicit discharges that enter the stormwater conveyance system and illicit discharges that are prevented from entering the stormwater drain conveyance system.

City of San Leandro

The Environmental Services Section (ESS) implements the City's MRP. ESS is the oversight agency for multiple mandated regulatory programs for businesses within the City's jurisdiction. ESS coordinates with the Alameda Countywide Clean Water Program and BASMAA. If an illicit discharge has imminent potential to reach surface water or is actually discharging to surface water, ESS coordinates with other City staff (collections system, building and safety inspectors), outside agencies (Alameda County Environmental Health, Alameda County Public Works Agency, Alameda County Fire Department, Oro Loma Sanitary District, OES, Fish & Wildlife), and response and cleanup contractors. An immediate multiagency approach is key to preventing discharges from reaching receiving waters and/or mitigating harm.

Complaints are resolved within 10 days, or in an alternate reasonable, timely manner, depending on the corrective action required (e.g., replacing sewer laterals, installing/replacing equipment, building/obtaining secondary containment, abating releases during dry weather months). ESS received 21 stormwater-related complaints

between the years 2017–2018. Seven verbal and/or written warnings were issued, and one administrative action (NOV) was issued.

City of Union City

Union City’s Illicit Discharge Complaint and Response Program has continued to improve, especially with the online web-based reporting portal introduced in 2016. The online reporting system has led to increased reporting and better follow-up, though most reports are for illegal dumping of furniture or debris rather than more traditional discharges capable of reaching the storm drain system.

The data reported in Table 7-6 represents all incidents of spills, dumping, or discharges, substantiated and unsubstantiated in the field, and those that are prevented from reaching storm drains/receiving waters. The City has noted that some discharging activities remain common, such as washing floor mats and improper grease storage, especially at restaurants and other food service facilities. The City has engaged in progressive enforcements for any sites that continue to cause clean water problems. Also, the City has employed programs to identify frequent dischargers and designate a specific inspector to them. This program has been very effective regarding the reduction of actual and potential discharges. However, due to staff turnover, the City has fallen significantly behind on formal enforcement for illicit dischargers.

7.5.7 - SERVICE CHALLENGES

The agencies described a number of challenges involved in ensuring effective stormwater services: prompt response is variable due to lengthy travel time or access issues; funding was cited as a major problem; and the enactment of new NPDES requirements pose challenges to the agencies. In Dublin, Livermore, and Pleasanton, agencies face increasing strains on stormwater systems as a result of new development. These challenges are listed in Table 7-6. The Five Canyons CSA is included in the performance indicators for Alameda County.

7.6 - Financing Constraints and Opportunities

Service-related financing constraints and opportunities are discussed in this section. The scope includes revenue sources, financing constraints, rates, and connection fees. The section identifies financing, rate restructuring, and cost-avoidance opportunities.

7.6.1 - FINANCING RESOURCES

Service charges, connection fees, property tax, assessments, and voter-approved measures are significant revenue sources for storm drainage enterprises in Alameda County. There is a basic difference in how single service and multiservice agencies collect funds for storm drainage enterprises. It appears that multiservice agencies are able to split overhead costs within their rates of multiple municipal services in order to provide lower overall costs for storm drainage services, whereas single service agencies must include all overhead within

the rate for storm drainage services. In some cases, agencies have levied assessment or property-related charges/fees to aid with funding storm drainage services.

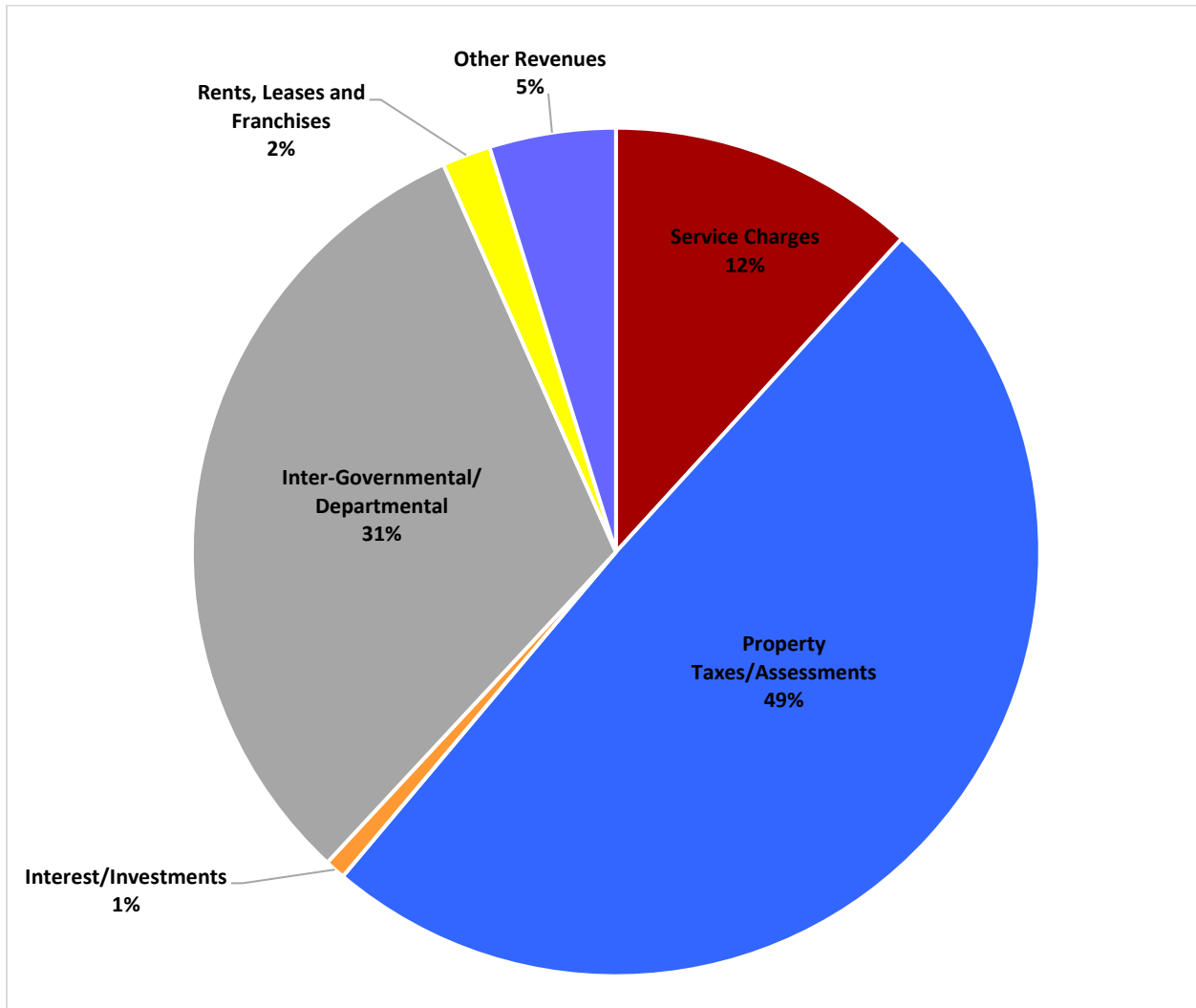
**Table 7-6
Service Challenges**

Agency	Service Challenges
Alameda	Limited funds for stormwater services.
Albany	Reduction of winter flooding in some areas and funding capital improvements.
Berkeley	Compliance with stormwater performance standards and funding for capital improvements.
Dublin	Growth and new pollution requirements.
Emeryville	System capacity, funding needed capital improvements, and NPDES permit requirements.
Fremont	NP
Hayward	New NPDES permit requirements and inadequate funding.
Livermore	Increased flow capacity of the system and pumps as development occurs.
Newark	New NPDES permit requirements.
Oakland	Limited funds for stormwater services, NPDES permit requirements, need to complete Storm Drainage Master Plan, and system age and capacity.
Piedmont	None
Pleasanton	New performance standards of the NPDES permit; construction and new development.
San Leandro	Unfunded State mandates and stagnant stormwater rates
Union City	New NPDES permit requirements and decreased flow in the County flood control system.
Five Canyons CSA	None.
Alameda County	Inadequate funding levels for new NPDES pollution control requirements.

Approximately 80 percent of all revenues for these agencies comes from property tax or assessments and intergovernmental transfers. Funding by Five Canyons CSA is much different than the cities or the County, who do not have an enterprise fund specifically for storm drain services. As a specialized service provider, funding is directly tied to providing the enterprise, whereas cities are tasked with allocating funds for multiple service needs. Therefore, cities are forced to “pick and choose” allocations of revenues from the general fund to support facilities in the most need of repair in some cases. Therefore, storm drainage facilities may be underfunded in some years and may go underfunded until a critical issue arises. As noted by the City of Alameda in their Fiscal Year 2019–2021 budget, there are significant infrastructure improvements that need to be made to the storm drainage infrastructure but remain unfunded in the Capital Improvement Program. Alameda does

have a parcel assessment which they are looking to increase to properly fund storm drainage improvements. It did not appear that any other city or agency was as proactive and did not have any sort of assessment or specific service fee for storm drainage purposes.

**Chart 7-1
Storm Drainage Agency Revenue Sources (2018)**



Service charges only comprise about 11 percent of total revenues, which is much different than traditional service providers than a specific enterprise. Rents, leases, and franchise agreements comprise only about two percent of total revenues.

Property taxes are subject to State constitutional limits established under Proposition 13. Furthermore, these revenues fluctuate with market conditions and do not recover at the same rate, which they decline due to Proposition 13. Property assessments are much more stable as they are not subject to property valuation changes. Generally, they are established through the Proposition 218 process and accompanied by some sort of engineering study, which establishes an assessment for a specific purpose to be levied to property owners. That

assessment can be adjusted annually with inflation as well, which makes a more reliable revenue source at times than property tax. However, most of the cities rely on property tax and assessments as their primary funding sources, comprising about half of all revenues. However, since these agencies are heavily reliant on property taxes, they may see more fluctuation in revenues than other agencies that are less reliant on property taxes and that are able to adjust rates based on inflation or other indexes from year to year. Again, establishing a specific benefit assessment to fund storm drainage services would reduce reliance on general revenues and decrease the likelihood of multiple years of substandard funding. Return on investments is a relatively simple way for agencies to accumulate additional revenue from the revenues or reserves which they have accumulated. It comprises almost one percent of total revenues for storm drainage service revenues.

Interdepartmental or governmental transfer is a revenue source that involves items such as credits for homeowners living within the district or transfer of money from another agency to the storm drainage enterprise. Some of these agencies have many other revenue sources that they could essentially loan the storm drainage enterprise if needed.

Lastly, all other revenue sources only comprise about five percent of overall revenues. The fact that these sources are not heavily relied upon is important because it is likely that many revenue sources that are categorized as others may be one-time type sources and may not be available in future budgetary years.

7.6.2 - FINANCING CONSTRAINTS

Local agencies are required to maintain separate enterprise funds to ensure that finances are not commingled with the finances of other enterprises, such as water. Cities may not use the enterprise fund to finance general fund activities. Conversely, it is not illegal for a city to use general funds to support the storm drainage enterprise but is generally not favorable as it shows that the enterprise is not solvent and cannot support itself based on its current rate and operations structure. However, all the cities, with the exception of Berkeley and Hayward, utilize general fund allocations, which may allow for fluctuation of revenues for this service due to these funds being able to be used for other services, such as police, fire, and other utilities such as water, sewer, streets, and lighting.

Since the general fund is the primary funding source for storm drainage services, agencies must be cognizant of their infrastructure vulnerabilities and needs. For example, understanding the overall costs of deferred maintenance allows for programmatic improvements to be made through a Capital Improvement Program over a period of years. This five to 10-year plan would allow the agency to properly plan needed improvements in order to maintain adequate levels of service while also prioritizing funding between critical infrastructure systems.

**Table 7-7
Storm Drainage Agency Revenues (2018)**

Storm Drainage Agency	Service Charges	Property Taxes/ Assessments	Interest/ Investments	Inter- Governmental/ Departmental	Rents, Leases and Franchises	Other Revenues	Total
Alameda	\$16,756,676 11%	\$95,437,296 60%	\$1,754,691 1%	\$11,025,368 7%	\$3,477,465 2%	\$29,637,243 19%	\$158,088,739
Albany	\$2,923,863 9%	\$21,798,421 70%	\$277,354 1%	\$1,671,958 5%	\$590,567 2%	\$3,832,347 12%	\$31,094,510
Berkeley	\$16,809,835 6%	\$222,966,862 77%	\$3,259,231 1%	\$40,915,692 14%	\$3,222,390 1%	\$2,248,206 1%	\$289,422,216
Dublin	\$17,206,237 12%	\$92,434,448 65%	\$1,093,261 1%	\$2,682,123 2%	\$12,161,494 8%	\$15,883,090 113%	\$141,460,653
Emeryville	\$5,112,383 8%	\$44,714,170 74%	\$1,223,252 2%	\$3,807,645 6%	\$1,790,251 3%	\$3,699,862 6%	\$60,347,563
Fremont	\$32,542,470 10%	\$224,440,009 70%	\$1,261,900 <1%	\$24,500,781 8%	\$10,467,485 3%	\$24,199,956 8%	\$317,412,601
Hayward	\$21,001,175 14%	\$90,138,757 60%	\$1,227,931 1%	\$16,027,472 11%	\$10,066,278 7%	\$12,247,692 8%	\$150,709,305
Livermore	\$3,329,443 3%	\$88,881,073 67%	\$1,882,110 1%	\$7,442,331 6%	\$7,723,648 6%	\$23,154,249 17%	\$132,412,854
Oakland	\$147,670,495 13%	\$743,297,694 67%	\$11,330,283 1%	\$132,246,669 12%	\$25,076,768 2%	\$57,120,095 5%	\$1,116,742,004
Piedmont	\$5,387,798 18%	\$22,735,026 74%	\$228,832 1%	\$628,419 2%	\$1,063,713 3%	\$720,804 2%	\$30,764,592
Pleasanton	\$12,648,437 9%	\$105,944,548 78%	\$1,087,214 1%	\$5,814,012 4%	\$3,739,603 3%	\$6,604,462 5%	\$135,838,276
San Leandro	\$8,377,030 6%	\$91,911,379 69%	\$953,214 1%	\$12,758,805 10%	\$8,497,777 6%	\$11,363,575 8%	\$133,861,780

Storm Drainage Agency	Service Charges	Property Taxes/ Assessments	Interest/ Investments	Inter-Governmental/ Departmental	Rents, Leases and Franchises	Other Revenues	Total
Union City	\$10,683,089 12%	\$58,923,322 66%	\$888,230 1%	\$5,315,876 6%	\$5,655,087 6%	\$7,655,355 9%	\$89,120,959
Five Canyons CSA	\$674,128 98%	\$0 0%	\$10,980 2%	\$0 0%	\$0 0%	\$0 0%	\$685,108
Alameda County	\$350,340,606 13%	\$829,023,486 30%	\$16,882,068 1%	\$1,473,665,766 54%	\$8,920,212 <1%	\$68,413,601 2%	\$2,747,245,739
TOTAL	\$651,463,665	\$2,732,646,491	\$43,360,551	\$1,738,502,917	\$102,452,738	\$266,780,537	\$5,535,206,899
%	12%	49%	1%	31%	2%	5%	12%

The primary financing restrictions of public agencies are the limitations associated with rate increases and compliance with Proposition 218. Proposition 218 is a costly and involved process that requires justification for increases associated with operating the enterprise but also eventually requires approval of the voters. Voter support for any increase in financial obligations, such as fees or rates, can waiver based on events outside the control of the agency. Providing informative outreach and education is increasingly important to the viability of any increase in financial revenues under Proposition 218.

Propositions 13, 218, 26, and the Mitigation Fee Act are State constitutional and statutory provisions that establish various limits to how revenue can be generated by local agencies. A more detailed description of how these propositions constrain public agency revenues can be found in Section 4.5.2 of this MSR.

7.6.3 - FINANCING OPPORTUNITIES

There are two basic types of financing opportunities available to agencies. The first being one-time funds, such as grants, that may be used for a strategic need or project that helps to reduce the financial burden on ratepayers within the limits of the agency. These funds are usually competitive and require forward design and planning to be presented for funding from the grant or bond. The second type of funding is ongoing financial resources, such as taxes and rates. These funds are available annually through agency collection activities and are adopted through various methods, such as the annual budget or Proposition 218 process. These ongoing funding types are much more significant to the financial health of an agency.

Issuance of Bonds

Agencies may issue bonds to aid with funding infrastructure and improvements. However, the issuance of bonds requires sound budgeting as they become a debt service to the agency for a period, typically 20 to 30 years. That debt service must be paid back by the agency in order to maintain a decent credit rating. A decline in credit rating limits the agencies' ability to earn other financial loans or issuance bonds in the future. The agency may pay off bonds early if resources are available. Agencies may also include bond payments within the rate structure to aid in payback as well, but these increases typically require approval by customers in accordance with Proposition 218.

Increase Rates, Fees, and Special Taxes in accordance with Proposition 218

On November 5, 1996, the California electorate approved Proposition 218, the self-titled "Right to Vote on Taxes Act." Proposition 218 adds articles XIIC and XIID to the California Constitution and makes numerous changes to local government finance law. Proposition 218 was approved by a 56.6 percent to 43.4 percent vote. It requires voter approval for increases in general or special taxes, special assessments, and other property-related charges. The hurdle of obtaining a majority approval, and in some cases a two-thirds majority, by the electorate, has often limited the ability of agencies to increase revenues. In some cases, critical and unique issues do not require significant outreach to educate the electorate as it has already been publicized or create a critical issue that residents want to resolve. In other

cases, residents may review an increase in assessments or other charges as overreaching. The burden of proof to convince customers and voters is an issue that all agencies must consider when attempting to increase revenues subject to Proposition 218 through the electorate.

7.6.4 - RATES

It does not appear that any of the storm drainage agencies maintain actual rates to customers for direct service. Each agency uses some form of allocated funds, with the exception of Berkeley that uses a special assessment to fund storm drainage services. Hayward also has a utility tax that is addressed per parcel by the County, which is how the City's annual stormwater program is funded. As a result, there is no comparison of rates for this service.

7.6.5 - RESTRUCTURING OPPORTUNITIES

Restructuring of storm drainage agencies could be realized by the consolidation of services to a regional provider. However, many of the agencies that provide storm drainage services do so in collaboration with road maintenance of their streets. The cities coordinate their storm drainage maintenance services along with street sweeping or repairs. As a result, the cities may be better equipped to do cleaning and other maintenance within the right of way.

The maintenance of regional facilities may be better maintained by regional agencies, which has already been established through the Alameda Countywide Clean Water Program (ACCWP) of which the cities and County are a part of. The regional oversight for planning purposes allows for coordination. If the ACCWP were an operating entity, such as a large special district, there would be the ability to utilize economy of scale to maintain and develop such facilities. It is very similar to the circumstance with sewer treatment facilities. Many cities are not able to properly fund or maintain a regional plant, but an agency that covers multiple jurisdictions is able to realize the economy of scale for providing a similar service. However, the current setup of storm drainage appears to be operating in a coordinated fashion as far as discharging storm surcharges, but infrastructure still remains underfunded.

Additionally, the watershed areas are better defined by geographic region rather than political boundaries. Therefore, regional agencies may be a better oversight for overall storm drainage services since watersheds span larger areas, and coordination is required between agencies.

7.6.6 - COST AVOIDANCE OPPORTUNITIES

Cost avoidance opportunities are dependent on each agencies' willingness to communicate and share information with other agencies. The cities that operate and conduct storm drainage operations and maintenance may realize general fund revenue by creating a regional entity to collect funds and implement a regional infrastructure plan and maintenance program. Allowing another agency to take over their storm drainage responsibilities would allow the cities to keep general fund allocations for other essential services.

7.7 - Policy Analysis

This section provides policy analysis that is focused on local government agencies that provide storm drainage services. The policy analysis includes assessment of local accountability and governance, evaluation of management efficiencies, as well as the identification of government structure options that may be considered by LAFCO.

7.7.1 - LOCAL ACCOUNTABILITY

This section discusses local accountability and governance for the limited purpose agency and provides an overview of indicators of local accountability and governance for the multipurpose agencies.

All the agencies hold open elections for their governing bodies, prepare meeting agendas and minutes, and make staff and elected officials accessible. The cities are governed by council members which are either at-large or by districts. Five Canyons CSA and Alameda County are governed by the five-member County Board of Supervisors, all of which are elected on a non-partisan basis from a separate district where he/she lives. To make the supervisorial or council districts equal in population, the boundaries are adjusted every 10 years. Terms of office for the supervisors are four years. Alternate elections are held every two years for three supervisors and then for two supervisors. The Board updates constituents, broadcasts its meetings, solicits constituent input, discloses its finances, and posts public documents on its website.

7.7.2 - EVALUATION OF MANAGEMENT EFFICIENCIES

This section provides an analysis of management efficiencies at the local storm drainage agencies and considers the effectiveness of each agency in providing efficient, quality public services.

The ACCWP, of which all the aforementioned agencies are members, establishes the best management practices for all the agencies to operate in regard to storm drainage. The ACCWP facilitates local compliance with the Federal Clean Water Act, coordinating its activities with other pollution prevention programs, such as wastewater treatment plants, hazardous waste disposal, and water recycling. The ACCWP also works with public agencies from around the County to foster a culture of stewardship, educating residents and businesses alike on how to prevent stormwater pollution. The ACCWP implements best management practices (BMPs) with the California Stormwater Quality Association. This association has developed BMPs for the construction of commercial and industrial development and municipal and new development & redevelopment (Alameda Countywide Clean Water Program, 2003).

7.7.3 - GOVERNMENT STRUCTURE OPTIONS

The ACCWP, which is a partnership that is not subject to LAFCO oversight, appears to be a viable structure of organization that sets standard rules of operation for all the storm

drainage agencies within Alameda County. By utilizing the same management practices, all agencies can be evaluated evenly for performance.

The agencies should consider some sort of assessment or fee to collect countywide financing improvements to the storm drainage systems. Throughout the County, the agencies do not specifically collect revenues identified for storm drainage. Therefore, in order to properly fund and ensure that the infrastructure remains operational, the ACCWP and its member agencies should investigate proper financing measures to repair and maintain their corresponding systems. By doing so, all agencies would be prepared for various flooding events as well as be more equipped to deal with climate change impacts.

7.8 - Determinations

- Stormwater services within Alameda County are typically handled by each municipality and by the Alameda County Flood Control and Water Conservation District in unincorporated areas.
- In Alameda County, all the municipalities and Flood Control District have joined together in the Alameda Countywide Clean Water Program (ACCWP) and are regulated by the RWQCB San Francisco Region. These agencies and municipalities within Alameda County are Alameda County Flood Control and Water Conservation District, cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City, and Zone 7 Water Agency.
- Each agency is responsible for service within its boundary area. None of the agencies provide stormwater services outside their respective territory.
- A major driving factor affecting the capacity and utilization of stormwater facilities in Alameda County is the rate of precipitation. While precipitation amounts cannot be controlled, proper facilities can be managed when service needs can be determined upon annual rainfall amounts and seasonal heavy rainfalls.
- Stormwater service needs are also affected by pollutant loads in stormwater runoff and emerging regulatory requirements, including total maximum daily load requirements, for reducing pollutants to the maximum extent practicable.
- Over the next 15 years, stormwater service demand will likely increase to keep pace with growth in development (impervious areas) and regulatory requirements. Factors that affect stormwater service demand include the amount of rainfall, new development of storm drains and other stormwater infrastructure, development controls, as well as increased commercial and industrial growth.
- While most cities have facilities that are in fair to good condition, some cities such as Berkeley, Emeryville, and Oakland have systems that are either very old or cannot handle the necessary capacity.

- All the stormwater service providers participate in the countywide ACCWP, which coordinates the implementation of service activities and standards to combat stormwater pollution, develops regional programs that address both federal and State requirements, and fosters regional awareness of watershed and environmental priorities.
- The State Water Resources Control Board reports that the cities of Alameda and Oakland have had the most enforcement action and violations in the last five reporting years. Other agencies have minimal amounts.
- Each agency is responsible for providing an inspection program to curb illegal discharges, and BMPs have been developed to perform this activity effectively. The goal for agencies is to inspect high-priority areas at least once per year and survey each agency's entire drainage area within a five-year period.
- All the cities have active street sweeping, storm drain inspection, and litter control programs as required by the NPDES permit and monitor these activities through performance tracking.
- All agencies maintain illegal dumping prevention programs, some of which are stencils of "no dumping" on storm drains and public information and outreach. Illegal dumping enforcement is carried out through local agency responses to spills and reports of illegal dumping.
- Approximately 80 percent of all revenues for these agencies comes from property tax or assessments and intergovernmental transfers. Property taxes are subject to State constitutional limits established under Proposition 13. Property assessments are established through the Proposition 218 process and accompanied by some sort of engineering study, which establishes an assessment for a specific purpose to be levied to property owners. The primary financing restrictions of public agencies are the limitations associated with rate increases and compliance with Proposition 218. Storm drainage agencies do not maintain actual rates to customers for direct service.
- The ACCWP, of which all the aforementioned agencies are members, establishes the best management practices for all the agencies to operate in regard to storm drainage. The ACCWP facilitates local compliance with the Federal Clean Water Act, coordinating its activities with other pollution prevention programs, such as wastewater treatment plants, hazardous waste disposal, and water recycling. The ACCWP also works with public agencies from around the County to foster a culture of stewardship, educating residents and businesses alike on how to prevent stormwater pollution.
- The ACCWP sets standard rules of operation for all the storm drainage agencies within Alameda County. By utilizing the same management practices, all agencies can be evaluated evenly for performance.

- The ACCWP and its member agencies should investigate proper financing measures to repair and maintain their corresponding systems. By doing so, all agencies would be prepared for various flooding events as well as be more equipped to deal with climate change impacts.

SECTION 8 - AGENCY SUSTAINABILITY AND RESILIENCY

This section reviews the climate change resiliency efforts of agencies/cities in Alameda County. The section reviews how these services are provided and addresses questions relating to the overall environment changing in relation to climate change. This section is not a mandated discussion topic pursuant to Cortese-Knox-Hertzberg Act and Alameda LAFCO guiding policies. However, it was requested by Alameda LAFCO to be included in this MSR.

Climate change is already affecting the Bay Area and is projected to continue to do so well into the future. Current and projected climate changes include average temperatures, sea-level rise, reduced winter snowpack, altered precipitation patterns, and more frequent storm events. These changes have the potential for a wide variety of impacts, such as altered agricultural productivity, wildfire risk, water supply, public health, public safety, ecosystem function, and economic continuity.

8.1 - Climate Change Projections

Climate models have predicted an increase in warming throughout the 21st century, with average annual air temperature increasing about two degrees to five degrees by 2050. The Mediterranean seasonal precipitation pattern is expected to continue during the 21st century, with most of the precipitation occurring during winter from North Pacific storms. The hydroclimate (hydrology and weather) is expected to be influenced by the El Niño-Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO) with alternating periods of wet and dry water years. In the Sierra Nevada, there will be some shift to more winter precipitation occurring as rain instead of snow, with a reduction in snowpack accumulation and shifts in runoff patterns, especially during the summer and fall (San Francisco Bay Area Region, 2013).

Climate change is already affecting California's water resources. Bold steps must be taken to reduce greenhouse gas emissions. However, even if emissions end today, the accumulation of existing greenhouse gases will continue to impact the climate for years to come. Warmer temperatures, altered patterns of precipitation and runoff, and rising sea levels are increasingly compromising the ability to effectively manage water supplies, floods, and other natural resources.

8.1.1 - RAINFALL AND TEMPERATURE INFORMATION

Human activity, most notable the burning of fossil fuels like coal, gasoline, and natural gas to produce electricity, power vehicles, and heat buildings, introduces large amounts of carbon dioxide and other greenhouse gases into the atmosphere. These gases intensify the natural greenhouse effect, causing global average surface temperatures to rise, which leads to changes in global climate patterns. Disrupted climate patterns will have an impact on public health, social and economic systems, and the environment (Alameda County Climate Action Plan, 2010).

Temperatures in a single year, or an individual storm event, reflect current weather conditions, whereas climate refers to the average atmospheric conditions over a longer period of time. Physical and temperature evidence indicates that the planet is warming. For example, all but two years between 1997 and 2009 were classified as the warmest on record. NASA analysis of global surface temperatures shows that 2000 to 2019 have been warmer years on average by showing a positive deviation reading. In order to compare temperature data from 2000 to 2019 and derive a determination, NASA calculated trends in temperature anomalies, not absolute temperatures, but changes relative to the average temperature for the same month during the period of 1951 to 1980 (National Aeronautics and Space Administration, 2010).

In addition to temperature rise, more frequent and intense weather events, particularly storms during the winter rainy season, will increase risks of flooding, storm damage, and landslides. Similarly, there will be an increased risk to coastal infrastructure from sea-level rise and storm surges that extend floodplains inland and place additional stress on levees and infrastructure. As climate changes, there is no clear signal how precipitation accumulations may change for California. Although precipitation changes are uncertain, climate models agree that California will become warmer. The increased temperatures will mean more of the precipitation will fall as rain instead of snow which, will change the timing of river flows in the State. Efforts are underway to develop a metric to track the rain versus snow percentages and identify regions that are vulnerable to this transition that is already beginning (Department of Water Resources, 2019).

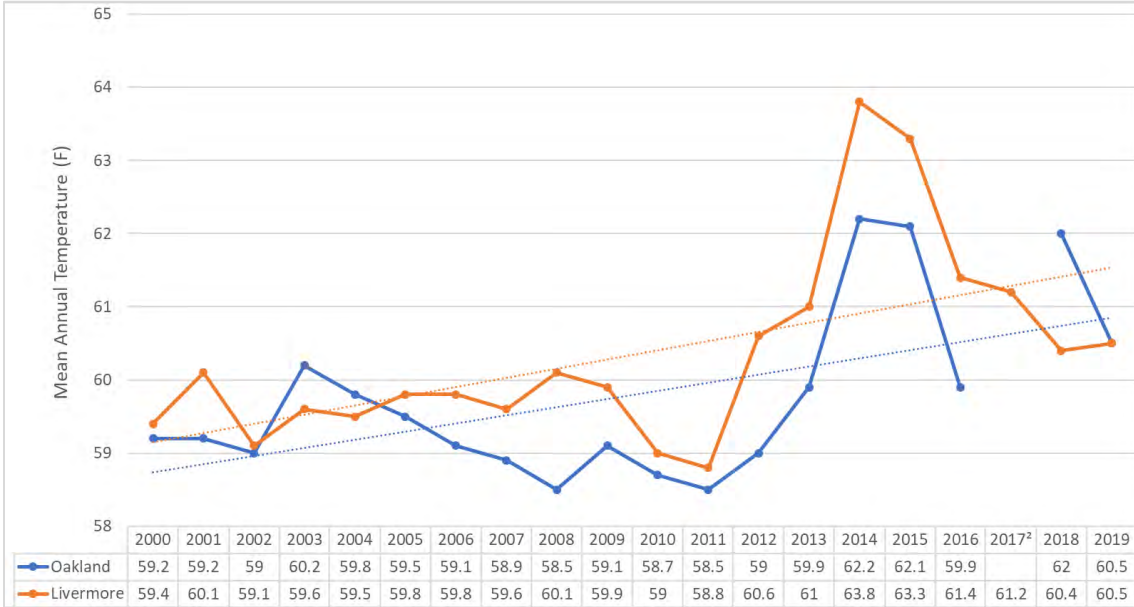
The data in Chart 8-1 shows the average annual temperature measured at weather stations in Oakland and Livermore. These two cities were chosen because they represent both sides of the geographical spectrum present in Alameda County. Oakland is more temperate, not experiencing many variations due to it bordering a large body of water (San Francisco Bay); however, the average temperature is showing an increase. Livermore is located approximately 20 miles from San Francisco Bay. Between the City and the Bay is a small mountain range, further reducing the amount of cool sea breeze reaching the City. This is apparent when comparing the two cities' temperature values. Livermore, at its peak, was nearly two degrees warmer in 2014 than Oakland.

The data in Chart 8-2 shows the average annual temperature measured at weather stations in Oakland and Livermore. Rainfall does not necessarily follow an upwards trend like temperature; however, as climate change progresses, there is an increased probability that storm events become more frequent and have an increased intensity, which is shown in Chart 8-2.

Precipitation changes may not only be caused by climate change but may affect climate change as well. According to research done by NASA, precipitation changes recorded over the 20th century are well-matched to trends in cloud cover measured over the past few decades. Precipitating clouds such as nimbostratus and cumulonimbus can affect the range of daily temperature extremes by reflecting sunlight effectively and keeping the ground cool during the day and trapping heat at their low bases at night. The observed narrowing of the daily temperature range may thus be one more piece of evidence showing how the earth's

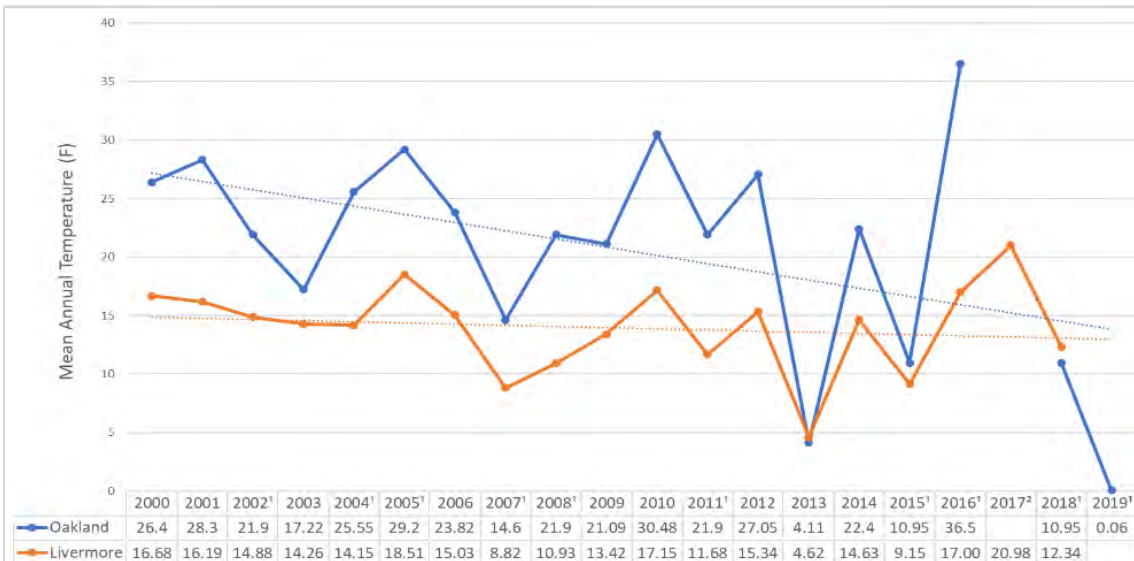
hydrologic cycle is changing in response to an increasing greenhouse effect (National Aeronautics and Space Administration, 1997).

Chart 8-1
Average Annual Temperature³⁶



Source: National Weather Service Forecast Office: San Francisco Bay Area/Monterey

Chart 8-2
Average Annual Precipitation³⁷



Source: National Weather Service Forecast Office: San Francisco Bay Area/Monterey

³⁶ Years followed by ² do not have any available data.

³⁷ Years followed by ¹ had missing sum data. In turn the mean data was taken and extrapolated in order to fill data gaps. Years followed by ² do not have any available data.

8.1.2 - SEA-LEVEL RISE AND COASTAL FLOODING

Sea-level rise is expected to increase the risk of coastal erosion and flooding along the California coast. Higher water levels due to sea-level rise could magnify the adverse impact of storm surges and high waves. Impacts to assets from extremely high tides, in addition to net increases in sea level, will likely result in increased inundation frequency, extents, and depths leading to catastrophic flooding and coastal erosion. Understanding the extent, depth, and duration of inundation and the patterns of erosion will be necessary for characterizing infrastructure vulnerability in coastal areas. In addition, sea-level rise has the potential to impact groundwater conditions in the East Bay Plain Subbasin and the Niles Cone Groundwater Basin. The picture is further complicated by the concurrent vertical movement of the land due to tectonic activity. Projections of the relative sea level, the sum of both sea-level rise and vertical land movement, are therefore important in the San Francisco Bay Area.

Sea-level has been measured at the Presidio tide gauge in San Francisco since 1854, with a recorded rise in relative sea-level of 7.6 inches (19.3 cm) over the last 100 years (San Francisco Bay Area Region, 2013). Rates of relative sea-level rise vary along the coast in relation to the varying vertical land movement. The observed rise per century is 8.0 inches (20.3 cm) in San Diego, 3.3 inches (8.4 cm) in Los Angeles, and 2.7 inches (6.9 cm) in Port San Luis. Sea-level is falling in Crescent City at a rate of 2.9 inches (7.4 cm) per century (San Francisco Bay Area Region, 2013). Present sea-level rise projections suggest that global sea levels in the 21st century can be expected to be much higher due to higher rates of relative sea-level rise.

**Table 8-1
Sea-Level Rise Projections**

Time Period	North of Cape Mendocino	South of Cape Mendocino
2000–2030	-2 to 9 in	2 to 12 in
2000–2050	-1 to 19 in	5 to 24 in
2000–2100	4 to 56 in	17 to 66 in

National Research Council, 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. Washington, DC: The National Academic Press.

8.2 - Resiliency Policies

This section provides information regarding the local agencies’ adopted policies or documentation that address climate change. If any agency does not have policies specifically addressing climate change, a recommendation has been added that the agency includes such sustainability and resiliency policies within either their next General Plan Update or a corresponding infrastructure Master Plan Update.

8.2.1 - REGIONAL COLLABORATION

San Francisco Bay Area Integrated Regional Water Management Plan

The San Francisco Bay Area Integrated Regional Water Management Plan (IRWMP) represents a significant accomplishment in regional water resources planning. It outlines the region's water resources management needs and objectives and presents innovative strategies and important actions to help achieve specific objectives regarding climate change. This plan updates and expands upon the 2006 IRWMP, documents progress towards meeting IRWMP objectives, and identifies ongoing regional needs and issues. This document includes many agencies in the Bay Area, including those in Alameda County.

Alameda County - Community Climate Action Plan

Alameda County covers all the agencies and governs land use for all the unincorporated areas of the County where some of the special districts operate. Furthermore, Alameda County could also be viewed as the agency which covers all other agencies as it does have jurisdiction over some aspects of governmental services within cities as well. Therefore, the County taking the lead to adopt a Community Climate Action Plan (CCAP) element of the General Plan is a leadership standard for other agencies to follow.

The County's adopted GHG emissions reduction target of 15 percent below 2005 baseline emission levels by 2020 is consistent with the recommendation contained within the State's Climate Change Scoping Plan, which calls on local governments to reduce emissions to 15 percent below current levels by 2020. The County has also adopted a longer-term target of 80 percent below 1990 emission levels by 2050.

However, in terms of resiliency planning, no specific policies are identified to address the impacts of climate change within the CCAP. Most of the policies aim to slow or reduce County contributions to climate change through reductions in water consumption, greenhouse gas emission, and energy consumption. Indirectly, the reduction in water consumption practices can be viewed as resiliency planning of sorts as it preserves the finite resource in the event it becomes scarcer over time. Development of specific resiliency policies on a countywide basis appears to be warranted.

8.2.2 - AGENCY PLANS AND POLICIES

Alameda County Water District - Urban Water Management Plan 2015-2020

The District's Urban Water Management Plan identifies that climate change will have a direct impact on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on the studies included within the plan, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones and a shift in snowmelt runoff to earlier in the year.
- Changes in the timing, intensity, and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow.
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity.
- Sea-level rise and an increase in the potential for saltwater intrusion in the Delta and coastal aquifers such as the Niles Cone.
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality.
- Increases in evaporation and transpiration (irrigation need).
- Changes in urban and agricultural water demand.

Given the growing population in the District's service area, the uncertain decisions related to the Bay-Delta Water Quality Control Plan, and the potential impacts of climate change to the District's existing water supplies, the District is actively looking ahead and evaluating potential future water supply initiatives to maintain and improve water supply reliability. Ongoing studies in this area include implementation of the California WaterFix project, expansion of regional surface water storage in Los Vaqueros Reservoir, and water reuse in partnership with Union Sanitary District.

The District identifies that some of its sources may be specifically impacted by climate change. For example, the inclusion of the State Water Project water supply allocation projects in District supplies accounted for early effects of climate change and sea-level rise for future operating conditions.

City of Albany - Conservation and Sustainability Element

Albany has addressed sustainability through the Conservation and Sustainability Element of the General Plan. It identifies the threat of climate change, and a reduced Sierra snowpack is directly tied to the need to conserve water and explore new sources to meet future needs.

As the City oversees the implementation of flood control services within the city limits, addressing sea-level rise would appear to be more important for Albany to address specifically. The General Plan supports shoreline restoration, waterfront recreational improvements, and strategies to improve resilience and adaptation as sea-level rises. Albany has policies related to working collaboratively with surrounding jurisdictions and regional agencies on adaptation planning for rising sea-level along the Albany shoreline, including any future reuse plans for Golden Gate Fields. Furthermore, the City works to ensure that proposed land uses and capital improvement decisions for the shoreline area consider long-term sea-level projections.

City of Alameda – Sanitary Sewer Master Plan 2017

Climate change and predicted sea-level rise may result in increased rainfall and higher groundwater levels in the system in the future. However, as the City continues to rehabilitate and replace sanitary sewers, and property owners replace their private service laterals, these changes are not expected to result in any further capacity issues in the Alameda sewer system.

City of Berkeley - Climate Action Plan

The City of Berkeley adopted a Climate Action Plan (CAP) in 2009 to review and address the need to adopt climate change adaptation policies. The document identifies Berkeley's role in coordinating with agencies in the region to further implementation of resiliency measures to address sea-level rise specifically as well as identify new water supplies within the region (City of Berkeley, 2009).

The City's adopted "Climate Adaptation Actions" are contained within Chapter 6 of the document and address a variety of resiliency issues, with Goal #1 to "Make Berkeley resilient to the impacts of climate change." More specifically, the policies include:

- Launching and sustaining a collaborative process for increasing Berkeley's and the region's preparedness for climate change impacts.
- In preparation for the impacts of climate change on the region's water resources, partnering with local, regional, and State agencies to encourage water conservation and efficiency and expand and diversify the water supply.
- In preparation for rising sea levels and more severe storms, partnering with local, regional, and State agencies to reduce the property damage associated with flooding and coastal erosion.
- In preparation for more extreme heat events, partnering with local, regional, and State agencies to protect and increase urban tree cover.

Castro Valley Sanitary District

No information was provided by the Castro Valley Sanitary District that identifies specific climate change and/or resiliency policies.

City of Dublin – 2020 Climate Action Plan and General Plan

The City of Dublin adopted the Climate Action Plan 2030 and Beyond (CAP) in September 2020. The CAP establishes Dublin's vision to reach carbon neutrality by 2045 and includes quantified actions to reduce greenhouse gas emissions by 65,090 MT CO_{2e} by 2030 while growing the population and while working towards a low carbon economy. The CAP contains five strategies, each with implementation measures that lead Dublin to achieve its CAP goals.

The City of Dublin General Plan includes a Water Resources Element. The purpose of the element is to ensure that the City's water resources are sustained and protected and to

consolidate information and policies related to the conservation and management of water resources, riparian corridors, and watershed lands. The element also defines the stormwater facilities needed to serve Dublin at the buildout of the General Plan (Dublin, 2020).

The City of Dublin Climate Action Plan 2030 and Beyond (CAP), adopted in September 2020, establishes Dublin's vision to reach carbon neutrality to reduce greenhouse gas emissions while growing the population and working towards a low carbon economy. The CAP contains five strategies, each with implementation measures that lead Dublin to achieve its CAP goals (Dublin, 2020).

Dublin-San Ramon Services District - 2015 Urban Water Management Plan

DSRSD's water demand and use patterns may be impacted by climate change. Increased irrigation demand is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperatures, and a longer growing season. Increasing the use of recycled water for these demands could mitigate the effects of climate change on water demand (Dublin San Ramon Services District, 2016).

East Bay Municipal Utility District - 2015 Urban Water Management Plan

East Bay Municipal Utility District strives to seek resiliency and plans for the future. Their Board adopted an Urban Water Management Plan and our Water Shortage Contingency Plan that looks to ensure water use into the future.

EBMUD plans to adjust its water supply portfolio as the impacts of climate change manifest. As part of its long-term water supply planning, EBMUD identified a wide range of supplemental supply, recycled water, and conservation projects that could help it meet future water supply needs. Recycled water and conservation programs reduce the demand for freshwater, thereby lessening the impact if supplies are impacted by climate change. EBMUD has set ambitious goals for both programs, with the expectation to deliver up to 20 mgd of recycled water by the year 2040 and to increase conservation to achieve water savings of up to 62 mgd.

City of Emeryville – Climate Action Plan and Sustainability Element

The City of Emeryville has adopted both a Climate Action Plan, partnered with Alameda County for the development of the CCAP, and also adopted a Sustainability Element within their General Plan. The Climate Action Plan and Sustainability Element require both City and private developers to reduce contributions to climate change through utilization of LEED and green building standards. The policies adopted to cover all the mandatory elements of the City's General Plan to prepare the community for current and future climate change impacts.

Five Canyons County Service Area

No information was provided by the Five Canyons County Service Area that identifies specific climate change and/or resiliency policies. However, since it is a dependent district of

Alameda County, the information provided pertaining to climate change and resiliency adopted by the County as a whole would also apply to the Five Canyons County Service Area.

City of Fremont - General Plan

The City of Fremont relies on ACWD and the ACFCWCD to address impacts to water supplies and flood control, respectively, as a result of climate change and resiliency, as stated in their Public Facilities Element of the General Plan. The General Plan includes other generalized policies related to helping reduce contributions of the City to climate change as well.

City of Hayward

The City's Water System Master Plan addresses readiness for climate change in multiple time frames. The near-term recommendations (0-3 years) related to climate change are to monitor SFPUC's activities related to evaluating climate change impacts to water supply. The long-term recommendation (3-10 years) related to climate change is "if climate change models predict significant reductions in water supply availability over the long-term and begin exploring opportunities to increase water supply reliability."

As documented in the City's 2010 UWMP, the SFPUC has completed an evaluation of the potential impacts of climate change on the SFPUC regional water system supplies and has concluded that climate change is not expected to impact available supplies through 2030. Moreover, SFPUC is completing further evaluations of climate change impacts on water supplies, and these studies will consider impacts through 2100. Given SFPUC's proactive stance regarding evaluating the risks of climate change, there are no additional climate-change actions recommended at this time. However, the City should keep abreast of the SFPUC studies, and if these studies demonstrate that impacts to water supplies are likely, the City should consider actions that will help ensure long-term supply reliability. Such actions may include, but are not necessarily limited to, exploration of indirect potable reuse opportunities and/or aquifer storage and recovery projects.

Also, Hayward's Climate Action Plan is a part of the General Plan that was updated in 2014. The CAP/GP was amended in June 2020 to include greenhouse gas reduction goals. There is also the Hayward Area Shoreline Planning Agency, which is a JPA made up of the City of Hayward, the East Bay Regional Park District, and the Hayward Area Recreation and Park District. The Shoreline Planning Agency is currently developing a Shoreline Master Plan to address sea-level rise.

City of Livermore - 2015 Urban Water Management Plan

The City's UWMP identifies some of the impacts related to water demand and climate change. Increased irrigation demand, increased evaporative losses due to warmer temperatures, and a longer growing season is anticipated when temperatures rise. Increasing the use of recycled water for these demands could mitigate the effects of climate change on water demand. The instability of the gaining levees in the Delta (including their vulnerability to seismic events and climate change), regulatory uncertainty, water quality issues including

saltwater intrusion, and the declining health of the Delta ecosystem challenge the long-term reliability of the State Water Project. Zone 7 and other SWP contractors are currently working with DWR and other key stakeholders to address the many complex issues undermining the Delta through the proposed California WaterFix. The proposed new diversion structure in the northern Delta, which allows for a dual-conveyance system, provides alternative intakes in case the Delta is affected by an earthquake, levee failure, or some other catastrophic event that impacts water quantity and quality in the Delta. DWR is working closely with regulatory and fish agencies to address regulatory uncertainty and protect the Delta ecosystem under an adaptive management framework based on the best available science. Finally, the dual conveyance system provides a tool for protecting fish during sensitive periods in the Delta. With these benefits, the California WaterFix is expected to significantly alleviate constraints on SWP operation and thus provide reliable water as climate change becomes more of a threat.

City of Newark - General Plan and Climate Action Plan

Newark adopted a Climate Action Plan (CAP) in 2010. Its overall goals are to reduce municipal GHG emissions by five percent between 2005 and 2012. The CAP calls for reducing municipal plus community GHG emissions by five percent between 2005 and 2015 and reducing community-wide GHG emissions by 15 percent between 2005 and 2020. Newark's CAP goals and priorities are supported by the General Plan. Policies are incorporated to reduce Newark's contribution to climate change as well by encouraging transit-oriented development, increasing transportation options, and planning for rising sea levels.

Additionally, although the City views flood risks due to sea-level rise as low, although flood risks are low, the City planned for sea-level rise and other risks associated with a changing climate within the Environmental Hazards Element of the General Plan.

City of Oakland - Resilient Oakland

The City of Oakland has adopted a document referred to as the "resiliency playbook." The Resilient Oakland playbook is a holistic set of strategies and actions to tackle systemic, interdependent challenges. This includes equitable access to quality education and jobs, housing security, community safety, and vibrant infrastructure, which will better prepare the City for shocks like earthquakes and climate change impacts. The playbook calls for significant investment in the forms of community engagement in order to educate residents on the resiliency needs of the City as well as fiscal investment to improve various infrastructure systems over time to be better prepared for the impacts of climate change (City of Oakland, 2016). Oakland also has a new Equitable Climate Action Plan and a Sea-Level Rise Action Plan that was led by the Department of Planning and Building.

Oro Loma Sanitary District - Sewer Management Plan

The District has identified the need to adapt its infrastructure system to climate change conditions. According to the District, the challenge associated with climate change is compounded by the uncertainty of whether the change will lead to more or less precipitation

and at what rate. The District assumes that climate change will lead to less annual precipitation but that it will occur in more intense periods. This assumption is conservative in that it requires the District to provide for peak storm capacity and periods of low flow, mimicking both flood and drought conditions on a regular basis. The District is also working with partners on the shoreline to plan and respond to sea rise. In partnership with Castro Valley Sanitary District, the District constructed a demonstration of a leading alternative to respond to sea rise. The District has partnered with UC Berkeley to assess the performance of the demonstration and advance the science of sea rise response. In 2015, the District constructed an eight million gallon equalization basin to store peak flows during storms. Combined with targeted upgrades in the collection system, peak flows to the treatment plant have been cut by nearly one-half over the past 25 years.

The District's current Pipeline Program is well aligned with adaption to climate change. At an average rate of 1.5 percent per year of pipe replacement, the District will have replaced nearly two-thirds of its collection system with HDPE pipe in the next 50 years. HDPE is a flexible and jointless piping system that is expected to reduce infiltration in our system over time. Less infiltration will counter the impacts of higher-intensity storms. HDPE is also a smoother pipe, and its jointless construction counters the impacts of drought or drought-like low flows. In short, the District's pace of pipe rehabilitation is expected to stay ahead of impacts from climate change (Oro Loma Sanitary District, 2021).

City of Piedmont - Natural Resources and Sustainability Element and Climate Action Plan

The City has adopted a Natural Resources and Sustainability Element that identifies policies related to sustainability. More specifically, the City identifies EBMUD as the primary partner in overseeing measures related to the water system of the residents. The City has worked with EBMUD to implement conservation measures to better utilize available water supplies and reduce waste with better landscape guidelines. The overall goal of the City is to reduce water use by 20 percent.

The City adopted its second Climate Action Plan (CAP 2.0) in March of 2018. The original CAP was adopted in 2010. The update to the document included specific adaptation objectives and corresponding action items to specifically deal with minimizing risks from flooding, excessive heat, and other extreme events, such as earthquakes (City of Piedmont, 2018).

City of Pleasanton - Urban Water Management Plan and Climate Action Plan

The City's UWMP outlines impacts to water supplies related to climate change. The document states that climate change can impact reliable water supplies through drought or decreasing overall quality.

The City's CAP also identifies potential vulnerabilities to the City as a result of climate change while also adopting strategic measures for adaptation. The goals of the City's CAP include adaptations to the following identified vulnerabilities: public health, water management,

agricultural and local food, ecosystems and biodiversity, and energy management (City of Pleasanton, 2011). The City is currently in the process of updating its CAP.

City of San Leandro - General Plan and Climate Action Plan

The City has adopted policies within the General Plan in multiple elements (Open Space, Parks and Conservation, as well as Environmental Hazards) that identify the need to be resilient in design as it relates to climate change. Specifically, the City identifies the more frequent extreme weather events, temperature extremes, and prolonged drought for the need to design rights of way, parks, and other public spaces with appropriate resiliency measures.

San Leandro also adopted a Climate Action Plan in 2009 based on the five-step milestone process to address climate change, as identified by the Local Governments for Sustainability (ICLEI). The CAP outlines goals that cover four basic categories: building energy use, transportation and land use, waste reduction and recycling, and municipal operations. However, it does not appear that the plan includes specific resiliency or adaptive measures but instead focuses on limiting the City and its residents' contributions to climate change rather than reacting to its impacts (City of San Leandro, 2009).

City of Union City - General Plan and Climate Action Plan

In December 2019, the City adopted an updated General Plan document. The guiding principles of the General Plan include sustainability and resiliency ideals to reduce GHG emissions, protect natural resources, promote sustainable energy levels, and enhance the City's ability to remain economically viable with extreme events caused by climate change. Additionally, within the Safety Element, the City specifically identifies adaptation and resiliency policies. More specifically, Goal S-6 states that the City "improve the resiliency of Union City through continued efforts to adapt and respond to impacts associated with climate change." Part of the interaction with other agencies includes coordination with the ACFCWCD, which oversees the flood control of the City (City of Union City, 2019).

The City also has an adopted CAP that identifies specific impacts as a result of climate change and needed adaptation and resiliency measures. These include examining the existing flood water system and determining the existing resiliency that exists as well as completion of various projects, such as the Salt Ponds Restoration Project, which aids in absorbing flood waters and slowly releases them back into the Bay (City of Union City, 2010).

Union Sanitary District

As a special district, the District did not adopt a Climate Action Plan or a General Plan. The District addresses items such as sea-level rise in its various assessment documents in order to prevent extreme events from inhibiting District operations.

Zone 7 Water Agency - 2015 Urban Water Management Plan and Capital Improvement Program

Zone 7 Water Agency prepared a UWMP that addresses local climate as well as water supply resiliency to determine if adaptive measures or policies need to be implemented in order to ensure service delivery to customers within the service area. Zone 7 specifies that the State Water Project (SWP) is the primary source of water for delivery to customers, estimated in 2020 as high as 90 percent of total water for the agency. The document identifies measures and actions taken by the District to further solidify water supplies within its boundaries to service current and future customers.

Within the adopted Capital Improvement Program (CIP), similar findings exist. Zone 7 acknowledges the SWP reliability has been declining over the years due to increasingly stringent regulations, declining infrastructure and Delta conditions, and climate change. To protect the Valley's major water supply, Zone 7 has been supporting the CA WaterFix, the State of California's proposed project to upgrade the SWP system infrastructure and operations and improve its long-term reliability while protecting the Sacramento-San Joaquin Delta (Delta) ecosystem. To that end, Zone 7 continues to evaluate alternative water supply and storage options such as the Bay Area Regional Desalination Project, potable reuse, Los Vaqueros Expansion Sites Reservoir, and water transfers.

8.3 - Determinations

- Climate models have predicted an increase in warming throughout the 21st century, with average annual air temperature increasing about two degrees to five degrees by 2050.
- Warmer temperatures, altered patterns of precipitation and runoff, and rising sea levels are increasingly compromising the ability to effectively manage water supplies, floods, and other natural resources.
- The San Francisco Bay Area Integrated Regional Water Management Plan (IRWMP) outlines the region's water resources management needs and objectives and presents innovative strategies and important actions to help achieve specific objectives regarding climate change. The IRWMP identifies ongoing regional needs and issues. This document includes many agencies in the Bay Area, including those in Alameda County.
- Alameda County's adopted GHG emissions reduction target of 15 percent below 2005 baseline emission levels by 2020 is consistent with the recommendation contained within the State's Climate Change Scoping Plan. Most of the policies aim to slow or reduce County contributions to climate change through reductions in water consumption, greenhouse gas emission, and energy consumption. Indirectly, the reduction in water consumption practices can be viewed as resiliency planning of sorts as it preserves the finite resource in the event it becomes scarcer over time.

- Alameda County Water District’s Urban Water Management Plan identifies that some of its sources may be specifically impacted by climate change. For example, the inclusion of the State Water Project water supply allocation projects in District supplies accounted for early effects of climate change and sea-level rise for future operating conditions.
- The City of Albany has addressed sustainability through the Conservation and Sustainability Element of the General Plan. The General Plan supports shoreline restoration, waterfront recreational improvements, and strategies to improve resilience and adaptation as sea-level rises. Albany has policies related to working collaboratively with surrounding jurisdictions and regional agencies on adaptation planning for rising sea-level along the Albany shoreline, including any future reuse plans for Golden Gate Fields. Furthermore, the City works to ensure that proposed land uses and capital improvement decisions for the shoreline area consider long-term sea-level projections.
- The City of Alameda’s Sanitary Sewer Master Plan states that as the City continues to rehabilitate and replace sanitary sewers and property owners replace their private service laterals, these changes are not expected to result in any further capacity issues in the Alameda sewer system.
- The City of Berkeley adopted a Climate Action Plan (CAP) in 2009 to review and address the need to adopt climate change adaption policies. These policies include launching and sustaining a collaborative process for increasing Berkeley’s and the region’s preparedness for climate change impacts, encouraging water conservation and efficiency and expand and diversify the water supply, partnering with local, regional, and State agencies to reduce the property damage associated with flooding and coastal erosion, and increasing urban tree cover to prepare for more extreme heat events.
- The City of Dublin Climate Action Plan 2030 and Beyond (CAP), adopted in September 2020, establishes Dublin’s vision to reach carbon neutrality to reduce greenhouse gas emissions while growing the population and working towards a low carbon economy. The CAP contains five strategies, each with implementation measures that lead Dublin to achieve its CAP goals. East Bay Municipal Utility District strives to seek resiliency and plans for the future. Their Board adopted an Urban Water Management Plan and our Water Shortage Contingency Plan that looks to ensure water use into the future.
- Hayward’s Climate Action Plan was incorporated into its General Plan in 2014. In 2020, Hayward adopted GHG reduction goals to achieve a 55 percent reduction by 2030 and carbon neutrality by 2045. In 2021, Hayward commenced a CAP update to develop a roadmap to meet the new goals. In addition, Hayward worked with the Hayward Area Shoreline Planning Agency (HASPA) to prepare the Hayward Regional

Shoreline Adaptation Master Plan (completed in February 2021) to identify the strategies and projects needed to address sea-level rise.

- The City of Livermore’s Urban Water Management Plan identifies some of the impacts related to water demand and climate change and suggests increasing the use of recycled water.
- The City of Newark’s Climate Action Plan goals and priorities are supported by their General Plan. Policies are incorporated to reduce Newark’s contribution to climate change as well by encouraging transit-oriented development, increasing transportation options, and planning for rising sea levels.
- The City of Oakland has adopted a document referred to as the “resiliency playbook.” The Resilient Oakland playbook is a holistic set of strategies and actions to tackle systemic, interdependent challenges. This includes equitable access to quality education and jobs, housing security, community safety, and vibrant infrastructure, which will better prepare the City for shocks like earthquakes and climate change impacts.
- Oro Loma Sanitary District’s Pipeline Program is well aligned with adaptation to climate change. Over the next 10 years, the District will be replacing 1.5 percent/year of its system and will have replaced nearly two-thirds of its collection system with HDPE pipe in the next 50 years. The HDPE piping system is expected to reduce infiltration over time, which will counter the impacts of higher-intensity storms.
- The City of Piedmont has adopted a Natural Resources and Sustainability Element that identifies policies related to sustainability, with an overall goal of reducing water use by 20 percent. The City has also adopted a Climate Action Plan that includes specific adaptation objectives and corresponding action items to specifically deal with minimizing risks from flooding, excessive heat, and other extreme events, such as earthquakes.
- The City of Pleasanton’s Climate Action Plan identifies potential vulnerabilities to the City as a result of climate change while also adopting strategic measures for adaptation. The goals of the City’s CAP include adaptations to the following identified vulnerabilities: public health, water management, agricultural and local food, ecosystems and biodiversity, and energy management.
- The City of San Leandro has adopted a Climate Action Plan that outlines goals covering four basic categories: building energy use, transportation and land use, waste reduction and recycling, and municipal operations. However, it does not appear that the plan includes specific resiliency or adaptive measures but instead focuses on limiting the City and its residents’ contributions to climate change rather than reacting to its impacts.

- Union City has an adopted Climate Action Plan that identifies specific impacts as a result of climate change and needed adaptation and resiliency measures. These include examining the existing flood water system and determining the existing resiliency that exists as well as completion of various projects, such as the Salt Ponds Restoration Project, which aids in absorbing flood waters and slowly releases them back into the Bay.
- The Union Sanitary District addresses items such as sea-level rise in its various assessment documents in order to prevent extreme events from inhibiting District operations.
- Zone 7 Water Agency's Urban Water Management Plan addresses local climate as well as water supply resiliency to determine if adaptive measures or policies need to be implemented in order to ensure service delivery to customers within the service area.
- To provide a resilient water supply in the region in the face of climate change there should be closer collaboration between water and wastewater agencies to maximize the use of wastewater through water recycling and potable reuse.

SECTION 9 - SPHERE OF INFLUENCE REVIEW

9.1 - Sphere of Influence Overview

The primary purpose in reviewing Spheres of Influence (SOI) of the reviewed agencies is to evaluate if a boundary change is appropriate and necessary, determine if the agencies can feasibly provide well planned efficient services in their service territory and if the current location of the SOI will be a benefit to those that receive services and property owners in the area.

As part of any SOI review, LAFCO is required to consider all the information presented in the MSR conducted for that agency. Additionally, LAFCO policies and procedures indicate that written statements of its determinations must be made for the following:

- The present and planned land uses (including agricultural and open space lands).
- The present and probable need for public facilities and services.
- The present and probable future capacity of public facilities and services.
- The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency.
- The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI.

After a written determination has been made with respect to the aforementioned areas of review, LAFCO may adopt an SOI that is appropriate for the agency's provision of service.

This section of the report fulfills the requirements of Government Code Section 56425 and allows LAFCO to adopt an SOI that is consistent with the written determinations for the service providers which provide any of the analyzed services. Multipurpose service providers who provide additional municipal services outside of the purview of this MSR, such as the cities whose SOIs were reviewed in 2018, must be analyzed by LAFCO before comprehensive SOI recommendations can be made. Therefore, all cities' recommendations have been excluded from this analysis, except for the City of Pleasanton, who specifically requested an analysis of their SOI with this MSR.

9.2 - Sphere of Influence Review

9.2.1 - ALAMEDA COUNTY WATER DISTRICT

The SOI for the ACWD encompasses the cities of Fremont, Newark, and Union City while including a portion of Hayward as well as planned areas of growth beyond the city limits of each jurisdiction. The primary planning documents for the District include the growth projections of each jurisdiction and would be able to accommodate their growth within the existing SOI. Therefore, this review recommends that Alameda LAFCO maintain and reaffirm the existing SOI for ACWD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open space lands)</i>	ACWD does not have land use authority to adopt a general plan for growth. The District plans within its boundaries based on population projections provided by ABAG. The District's Urban Water Management Plan uses these projections to properly plan water supply resources until 2040 based on existing and probably growth patterns. Therefore, present and planned land uses are adequate for existing residents as well as future growth, as demonstrated in the Urban Water Management Plan.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for the ACWD. The level of demand for these services and facilities, however, will increase commensurate with anticipated population growth over the next five years, as shown in the population projects provided by ABAG and reflected in the Urban Water Management Plan.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in ACWD appears adequate. The District anticipates it will continue to have adequate capacity during the next five years.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within the ACWD's municipal boundary are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	ACWD does not provide structural fire protection or sewer facilities and services within its SOI. ACWD only provides water within its boundaries. However, there are no DUCs within or contiguous to the SOI for ACWD; therefore, no present or probable need for these facilities and services for DUCs.

9.2.2 - ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

The SOI for the ACFCWD encompasses all territory within Alameda County. The ACFWCD is the main flood control service provider in the County. The District is a dependent district governed by the County Board of Supervisors. The oversight of the agency allows it to plan comprehensively for municipal services. The primary planning documents for the District includes the growth projections countywide and would be able to accommodate their

growth within the existing SOI. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for ACFCWD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open space lands)</i>	ACFCWD does not have direct land use authority to adopt a general plan for growth, although the governing board is the Board of Supervisors of Alameda County. The District plans within its boundaries based on population projections provided by ABAG. The District uses these projections to properly plan flood control improvements to correspond with existing and probable growth patterns. Therefore, present and planned land uses are adequate for existing residents as well as future growth.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for the ACFCWD. The level of demand for these services and facilities, however, will increase commensurate with anticipated population growth over the next five years, as shown in the population projections provided by ABAG and reflected in the Capital Improvement Program, which was adopted during fiscal year budget hearings, accommodating district-wide needed improvements.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in ACFCWD appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources. Furthermore, the District has begun preparation for unforeseen future impacts, such as climate change related flooding from sea-level rise or increased precipitation, with the adoption of the Alameda County Climate Action Plan.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	Any communities of interest within the ACFCWD's municipal boundary are already included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged</i>	ACFCWD does not provide structural fire protection, water service, or sewer facilities and services within its SOI. However, the community of Ashland is already

Criteria	Determination
<i>unincorporated communities within the existing SOI</i>	within the SOI for ACFCWD; therefore, no amendment to the SOI is warranted.

9.2.3 - CASTLEWOOD COUNTY SERVICE AREA

The SOI for the Castlewood CSA is coterminous with the existing service boundary. The District only services the existing neighborhood within its boundaries with no intention to accommodate growth. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for Castlewood CSA.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open-space lands)</i>	Castlewood CSA does not have direct land use authority to adopt a general plan for growth, although the governing board is the Board of Supervisors of Alameda County. Additionally, growth within the District is not anticipated as the CSA was originally established to service the existing neighborhood and no development beyond the area. The facilities and services provided have been based on the existing development established and does not anticipate expansion. Therefore, present and planned land uses are adequate for existing residents as well as future growth, which is none.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for Castlewood CSA as no growth is proposed. The level of demand for these services and facilities will not increase. The Capital Improvement Program adopted during fiscal year budget hearings accommodates district-wide needed improvements for the existing SOI.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in Castlewood CSA appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the CSA continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission</i>	No communities of interest within Castlewood CSA are included within the SOI.

Criteria	Determination
<i>determines that they are relevant to the agency</i>	
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	Castlewood CSA does not provide structural fire protection but does provide water service or sewer facilities and services within its SOI. However, there are no identified DUCs within or near the SOI; therefore, no amendment to the SOI is warranted.

9.2.4 - CASTRO VALLEY SANITARY DISTRICT

The SOI for the CVSD is coterminous with the service area and encompasses territory within Alameda County and includes the Castro Valley planned urban area. The CVSD is the sole service provider in Castro Valley. The District is an independent district governed by a board of directors. As the District is already coterminous with the service area, there is no anticipated growth which needs to be accommodated, the Castro Valley urban area has not been amended, and plans to accommodate only minor growth over the next five years. Furthermore, with the passage of Measure D, resource management land surrounding Castro Valley limits expansion. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for CVSD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open space lands)</i>	CVSD does not have direct land use authority to adopt a general plan for growth. Additionally, growth within the District is not anticipated as the District was established to service the urban area identified within the County General Plan. The facilities and services provided have been based on the existing development established and does not anticipate expansion. Therefore, present and planned land uses are adequate for existing residents as well as future growth, which is none.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for CVSD as no growth is proposed. The level of demand for these services and facilities will not increase. The Capital Improvement Program adopted during fiscal year budget hearings and the Sewer System Management Plan accommodates district-wide needed improvements for the existing SOI.

Criteria	Determination
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in CVSD appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the District continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within CVSD are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	CVSD does not provide structural fire protection but does provide water service or sewer facilities and services within its SOI. However, there are no identified DUCs within or near the SOI; therefore, no amendment to the SOI is warranted.

9.2.5 - DUBLIN SAN RAMON SERVICES DISTRICT

The SOI for the DSRSD straddles the boundary of northern Alameda County and southern Contra Costa County. DSRSD includes the cities of Dublin, San Ramon, and the community of Dougherty Valley, with Dougherty Valley being completely in Contra Costa County. DSRSD also provides contract wastewater services in Pleasanton. The District plans accordingly through its Urban Water Management Plan and the Sewer System Management Plan to accommodate the service needs for its service area. The District is an independent district governed by an elected board of directors. As the District is already nearly coterminous with the service area, anticipated growth within the service area is already considered and accommodated with management planning documents. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for DSRSD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open-space lands)</i>	DSRSD does not have direct land use authority to adopt a general plan for growth. Additionally, growth within the District is anticipated to occur in accordance with ABAG projections, which correspond to the growth assumptions of the General Plans of the cities and Contra Costa County for Dougherty Valley. The District also accommodates capacity in the WWTP for the City of Pleasanton. The facilities and services provided have been based on the existing development patterns

Criteria	Determination
	established and does not anticipate significant alterations. The current land use plans that were adopted and incorporated into corresponding District planning documents are 2005 (Dougherty Valley), 2009 (Pleasanton), 2015 (San Ramon), and 2018 (Dublin). Therefore, present and planned land uses are adequate for existing residents as well as future growth in the next five years, at minimum.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for DSRSD. The level of demand for these services and facilities has been reviewed and accommodated within the master infrastructure planning documents of the District. The Capital Improvement Program adopted during fiscal year budget hearings and the Sewer System Management Plan accommodates district-wide needed improvements for the existing SOI.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in DSRSD appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the District continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within DSRSD are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	DSRSD does not provide structural fire protection but does provide water service or sewer facilities and services within its SOI. However, there are no identified DUCs within or near the SOI; therefore, no amendment to the SOI is warranted.

9.2.6 - EAST BAY MUNICIPAL UTILITY DISTRICT

The SOI for the EBMUD includes most of western Alameda County, which consists of the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont for both water and

wastewater service. EBMUD also provides the City of San Leandro and the unincorporated areas of Ashland, Cherryland, Castro Valley, Fairview, and San Lorenzo with water services only. The SOI was last expanded to include areas which the District was serving but were not within the SOI. The District is the largest municipal service provider in Alameda County and takes significant steps to plan for both growth and infrastructure improvements through a CIP and Master Plans. Oakland would be the main source of growth over the next five to 20 years but is already completely included with the service area boundary of the District. As a result, LAFCO has limited ability for review of growth as it would occur within incorporated boundaries already within the SOI. This situation is similar with all the other cities within the SOI as well. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for EBMUD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open-space lands)</i>	EBMUD does not have direct land use authority to adopt a general plan for growth. Additionally, growth within the District is anticipated to occur in accordance with ABAG projections which correspond to the growth assumptions of the General Plans of the cities within its service boundary, with the District preparing to accommodate approximately two million residents within Alameda County cities by 2040. The District also accommodates water supply and wastewater capacity in the WWTP for its customer agencies. The facilities and services provided have been based on the development patterns established with corresponding land use plans of its service area and have been incorporated into corresponding District planning documents. Therefore, present and planned land uses are adequate for existing residents as well as future growth in the next five years, at minimum.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for EBMUD. The level of demand for these services and facilities has been reviewed and accommodated within the master infrastructure planning documents of the District. The District plans to accommodate 350,000 additional residents within Alameda County through adoption of the Capital Improvement Program, the Sewer System Management Plan, and Water Management Plan, which accommodates district-wide needed improvements for the existing SOI.

Criteria	Determination
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in EBMUD appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the District continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as the rates and fees collected are crucial to implementing improvements needed for future growth anticipated within the existing SOI.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest that are not already included within EBMUD are identified or warranted to be included within SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	EBMUD does not provide structural fire protection but does provide water service or sewer facilities and services within its SOI. The community of Ashland was identified as a DUC but is already included within the SOI; therefore, no amendment to the SOI is warranted.

9.2.7 - FIVE CANYONS SERVICE AREA

The SOI for the Five Canyons CSA is coterminous with the existing service boundary. The District only services the existing neighborhood within its boundaries with no intention to accommodate growth. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for Five Canyons CSA.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open-space lands)</i>	Five Canyons CSA does not have direct land use authority to adopt a general plan for growth, although the governing board is the Board of Supervisors of Alameda County. Additionally, growth within the District is not anticipated as the CSA was originally established to service the existing neighborhood and no development beyond the area. The facilities and services provided have been based on the existing development established and does not anticipate expansion. Therefore, present and planned land uses are adequate for existing residents as well as future growth, which is none.

Criteria	Determination
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for Five Canyons CSA as no growth is proposed. The level of demand for these services and facilities will not increase. The Capital Improvement Program adopted during fiscal year budget hearings accommodates district-wide needed improvements for the existing SOI.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in Five Canyons CSA appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the CSA continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within Five Canyons CSA are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	Five Canyons CSA does not provide structural fire protection, water service, or sewer facilities and services within its SOI. Additionally, there are no identified DUCs within or near the SOI; therefore, no amendment to the SOI is warranted.

9.2.8 - ORO LOMA SANITARY DISTRICT

The SOI for the OLSD includes the southern portion of San Leandro, northern portion of Hayward, and the unincorporated areas of San Lorenzo, Cherryland, Ashland, and Fairview. The District plans accordingly through its Sewer System Management Plan to accommodate the wastewater needs for its service area. The District is an independent district governed by a board of directors. As the District is already nearly coterminous with the service area, anticipated growth within the service area is already considered and accommodated with management planning documents. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for OLSD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open space lands)</i>	OLSD does not have direct land use authority to adopt a general plan for growth. Additionally, growth within the District is anticipated to occur in accordance with ABAG projections which correspond to the growth assumptions of the General Plans of the cities and Alameda County for the unincorporated neighborhoods. The facilities and services provided have been based on the existing development patterns established and does not anticipate significant alterations. The current land use plans that were adopted and incorporated into corresponding District planning documents are 2014 (Hayward), 2015 (Ashland and Cherryland), and 2016 (San Leandro). Therefore, present and planned land uses are adequate for existing residents as well as future growth in the next five years, at minimum.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for OLSD. The level of demand for these services and facilities has been reviewed and accommodated within the master infrastructure planning documents of the District. The Capital Improvement Program, adopted during fiscal year budget hearings, and the Sewer System Management Plan accommodates district-wide needed improvements for the existing SOI.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in OLSD appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the District continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within OLSD are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged</i>	OLSD does not provide structural fire protection or water service but does provide sewer facilities and services within its SOI. The community of Ashland was

Criteria	Determination
<i>unincorporated communities within the existing SOI</i>	identified as a DUC but is already included within the SOI; therefore, no amendment to the SOI is warranted.

9.2.9 - UNION SANITARY DISTRICT

The SOI for the USD includes the cities of Fremont, Newark, and Union City. The District plans accordingly through its Sewer System Management Plan to accommodate the wastewater needs for its service area. The District also manages multiple drainage basin areas within the SOI to provide storm drainage services for the agencies. The District is an independent district governed by a board of directors. As the District is already nearly coterminous with the service area, anticipated growth within the service area is already considered and accommodated with management planning documents. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for USD.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open space lands)</i>	USD does not have direct land use authority to adopt a general plan for growth. Additionally, growth within the District is anticipated to occur in accordance with ABAG projections which correspond to the growth assumptions of the General Plans of the cities. The facilities and services provided have been based on the existing development patterns established and does not anticipate significant alterations. The current land use plans that were adopted and incorporated into corresponding District planning documents are 2011 (Fremont), 2013 (Newark), and 2019 (Union City). Therefore, present and planned land uses are adequate for existing residents as well as future growth in the next five years, at minimum.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for USD as no growth is proposed. The level of demand for these services and facilities will not increase. The Capital Improvement Program adopted during fiscal year budget hearings and the various basin Sewer System Master Plans accommodates district-wide needed improvements for the existing SOI.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity of public facilities in USD appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. If the District continuously updates

Criteria	Determination
	rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within USD are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	USD does not provide structural fire protection or water service but does provide sewer facilities and services within its SOI. However, there are no identified DUCs within or near the SOI; therefore, no amendment to the SOI is warranted.

9.2.10 - ZONE 7 WATER AGENCY

The SOI for Zone 7 includes much of central and eastern Alameda County, encompassing the entirety of the cities of Dublin, Pleasanton, and Livermore and portions of the cities of Fremont, Union City, and Hayward. The District manages water supplies within the SOI for the aforementioned agencies. The District is an independent district governed by a board of directors and was created by special legislation which gives it unique characteristics, such as allowing LAFCO to establish an SOI. The District secures the water resources for the agencies within its service boundary while also managing water resources, surface, and subterranean throughout the SOI. Therefore, this report recommends that Alameda LAFCO maintain and reaffirm the existing SOI for Zone 7.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open space lands)</i>	Zone 7 does not have direct land use authority to adopt a general plan for growth. Additionally, growth within the District is anticipated to occur in accordance with ABAG projections which correspond to the growth assumptions of the General Plans of the cities. The facilities and services provided have been based on the existing development patterns established and does not anticipate significant alterations. The current land use plans that were adopted and incorporated into corresponding District planning documents, mainly the Urban Water Management Plan, which plans to serve approximately 285000 residents by 2040 are 2005 (Livermore), 2009 (Pleasanton), and 2018 (Dublin). Therefore, present and planned land uses are adequate

Criteria	Determination
	for existing residents as well as future growth in the next five years, at minimum.
<i>The present and probable need for public facilities and services</i>	There are no anticipated changes in the type of public services and facilities required within the SOI for Zone 7. The level of demand for these services and facilities will increase based on anticipated growth as well as assumptions made for dry year and climate changes, such as prolonged drought. The Capital Improvement Program, adopted during fiscal year budget hearings, and Urban Water Management Plan accommodates district-wide needed improvements and water planning for the existing SOI for five years, at minimum.
<i>The present and probable future capacity of public facilities and services</i>	The present capacity or supply of public facilities in Zone 7 appears adequate. The District anticipates it will continue to provide adequate levels of services based on existing financing resources, which includes a specific rate based on service levels. All rates to customer agencies include charges that aid in the acquisition of water resources of Zone 7 that correspond with growth needs of the SOI. If the District continuously updates rates accordingly with appropriate inflation and/or construction costs indices, service levels will remain adequate as no future capacity will be needed.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	No communities of interest within Zone 7 are included within the SOI.
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	Zone does not provide structural fire protection or sewer facilities or services but does provide water supply services within its SOI. However, there are no identified DUCs within or near the SOI; therefore, no amendment to the SOI is warranted. Ashland, which was identified as a DUC, is already located within the SOI of an agency which provides water service.

9.2.11 - CITY OF PLEASANTON

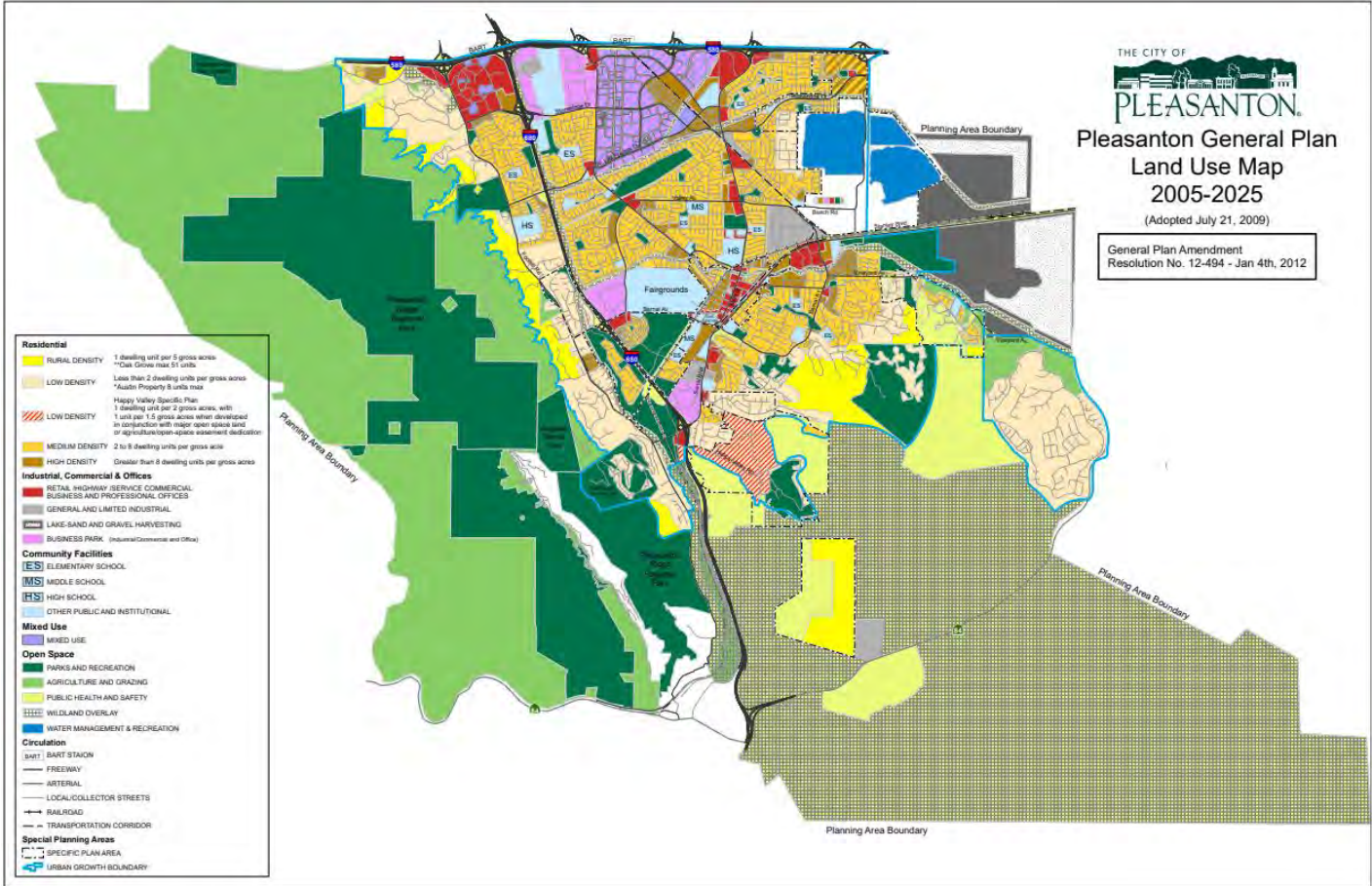
During the preparation of this MSR, the City of Pleasanton requested that LAFCO reconsider the City’s Sphere of Influence. The City notes that the current SOI encompasses areas that are

expansive and difficult to provide water and wastewater services effectively. It believes these areas are unlikely to be developed for other reasons such as steep slopes and open spaces. The City would like an opportunity to offer a revised SOI boundary. The City is currently revising its Water System Master Plan, which will include redefining its water service boundary. The City suggests that the new water system boundary will be a good starting place to revise the current SOI. Therefore, this report recommends that Alameda LAFCO consider a request by the City of Pleasanton to revise its Sphere of Influence after it completes its Water Service Master Plan. Analysis of the revised SOI should focus on the determinations in the following criteria.

Criteria	Determination
<i>The present and planned land uses (including agricultural and open-space lands)</i>	The City of Pleasanton’s General Plan Land Use Map (see Figure 9-1) identifies the location of an Urban Growth Boundary and areas that have existing specific plans. Areas not within the Urban Growth Boundary or within a specific plan area are designated open space areas that are not planned for development at urban or suburban densities. The current SOI includes some areas that are designated open space. A revised SOI could remove areas designated for open space uses. The SOI should still include areas within the city limits, Urban Growth Boundary, and/or a specific plan area.
<i>The present and probable need for public facilities and services</i>	Since the City is a multipurpose agency, the review of the SOI should include review of all services the City provides, not just water, wastewater collection, and storm drainage. That said, there appears to be areas within the SOI that are very likely to permanently remain in open space and have little need for municipal services.
<i>The present and probable future capacity of public facilities and services</i>	Since the SOI amendment would likely result in a reduction of territory within the SOI, this criterion is less critical. However, a review of the Water Master Plan that is currently being prepared, along with other infrastructure master plans, should be undertaken to ensure that the revised SOI does not include areas that are planned for service extension.
<i>The existence of any social or economic communities of interest if the commission determines that they are relevant to the agency</i>	Given its location, the SOI should continue to include the Castlewood area, even though most of the area has a County Service Area. There are existing urban uses that could utilize urban services in the East Pleasanton area. Planned specific plan areas should also be included.

Criteria	Determination
<i>The present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing SOI</i>	No disadvantaged communities have been identified in the area of the SOI.

Figure 9-1
City of Pleasanton General Plan Land Use Map



Source: City of Pleasanton

9.3 - Determinations

- All limited purpose special districts evaluated do not appear to require further review of the spheres of influence at this time.
- All cities’ recommendations have been excluded from this analysis, with the exception of the City of Pleasanton, who specifically requested an analysis of their SOI with this MSR.

- Alameda LAFCO should consider a request by the City of Pleasanton to revise its Sphere of Influence after it completes its Water Service Master Plan. Analysis of the revised SOI should focus on the City's General Plan Urban Growth Boundary, adopted specific plan areas, planned open space areas, Utility Master Plans, and communities of interest, such as the Castlewood and East Pleasanton areas.

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APPENDIX A

CITY MAPS



**Alameda
LAFCO**

City of Alameda

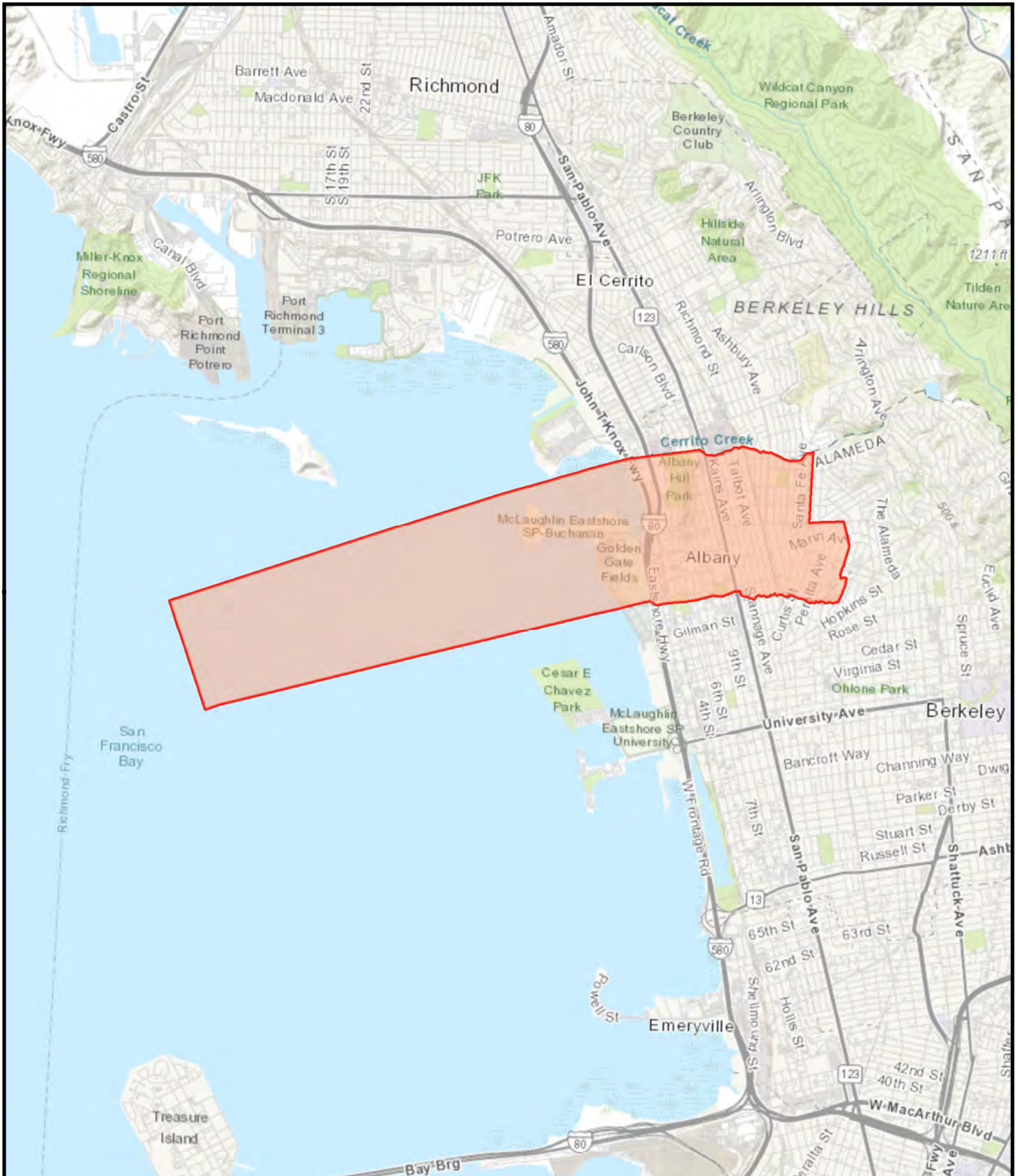
City Boundary Sphere of Influence



0 Miles 1

QK Sources:
ESRI Sources: Esri, HERE,

November 2021



**Alameda
LAFCO**

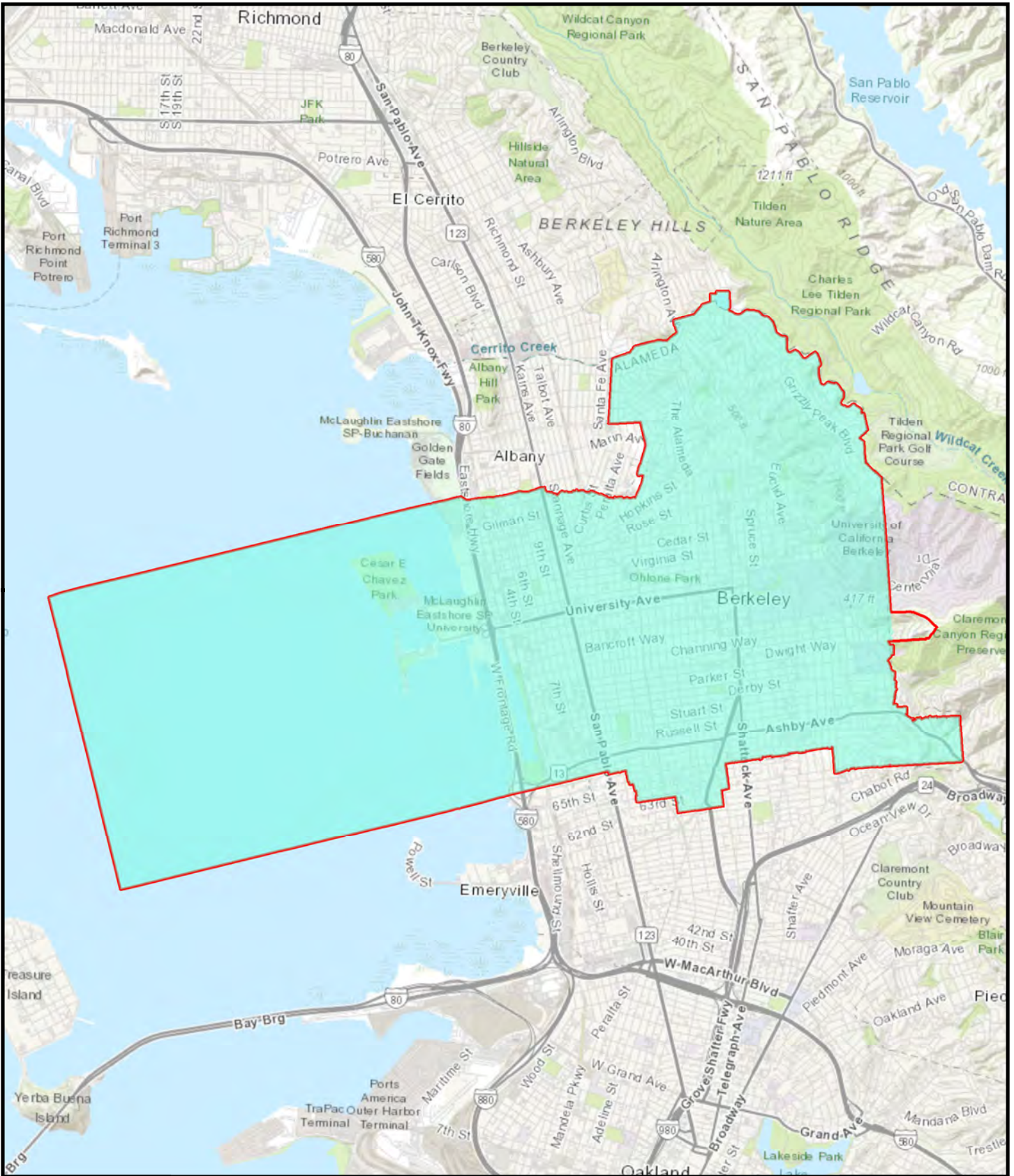
City of Albany

City Boundary
 Sphere of Influence



November 2021

QK Sources:
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

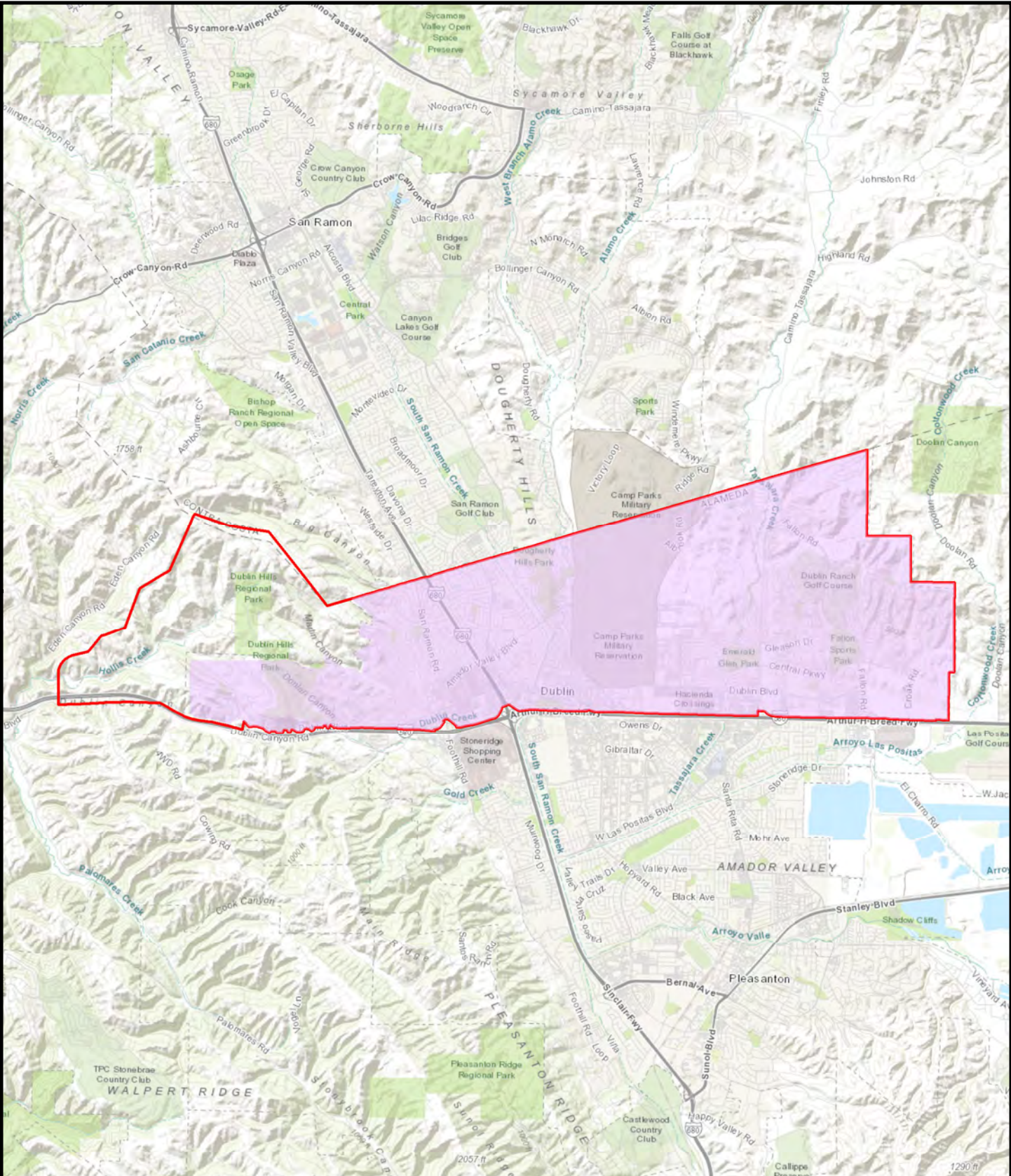
City of Berkeley

City Boundary
 Sphere of Influence



November 2021

QK Sources:
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

City of Dublin

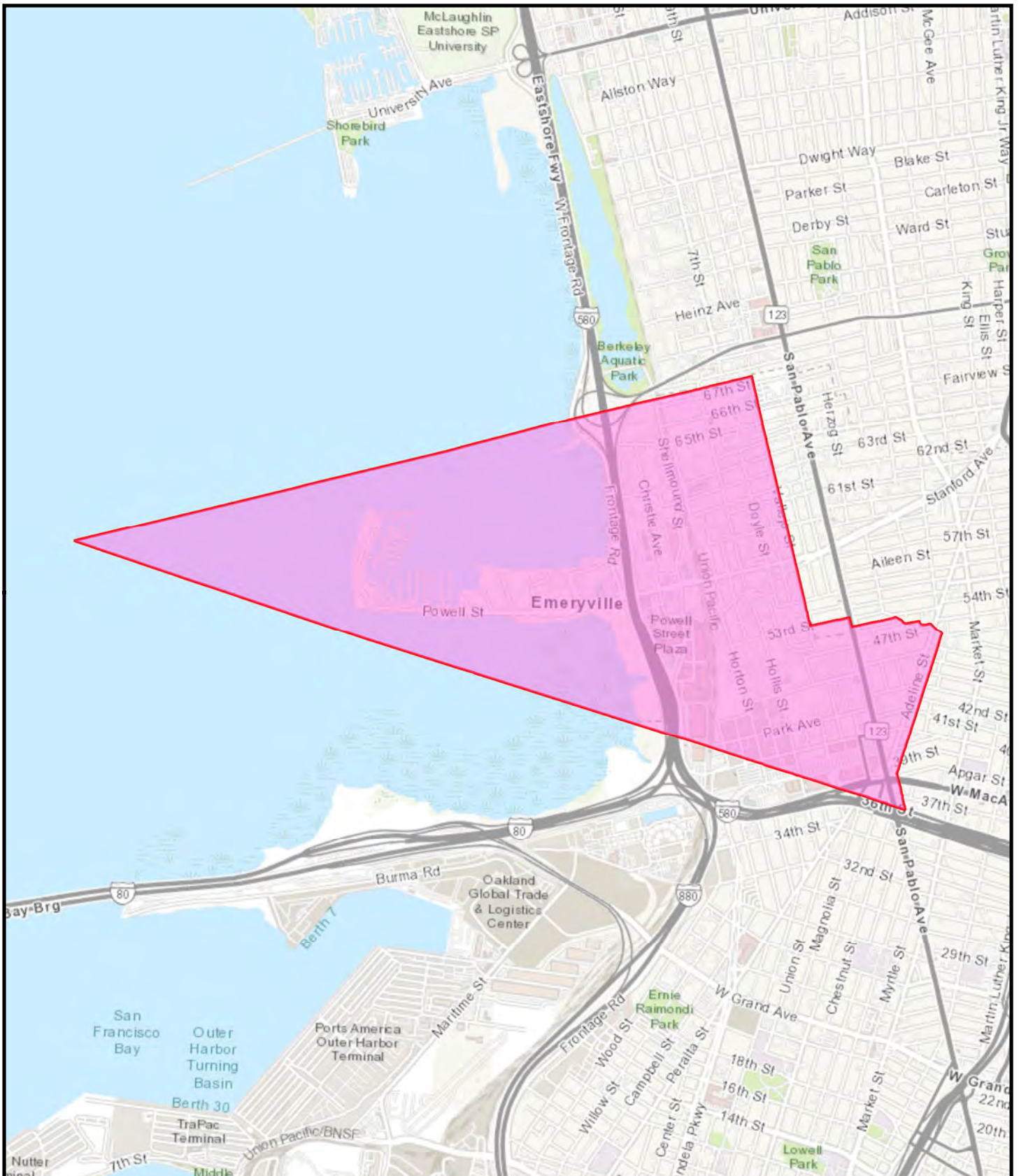
City Boundary
 Sphere of Influence



0 Miles 1.5

November 2021

QK Sources:
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

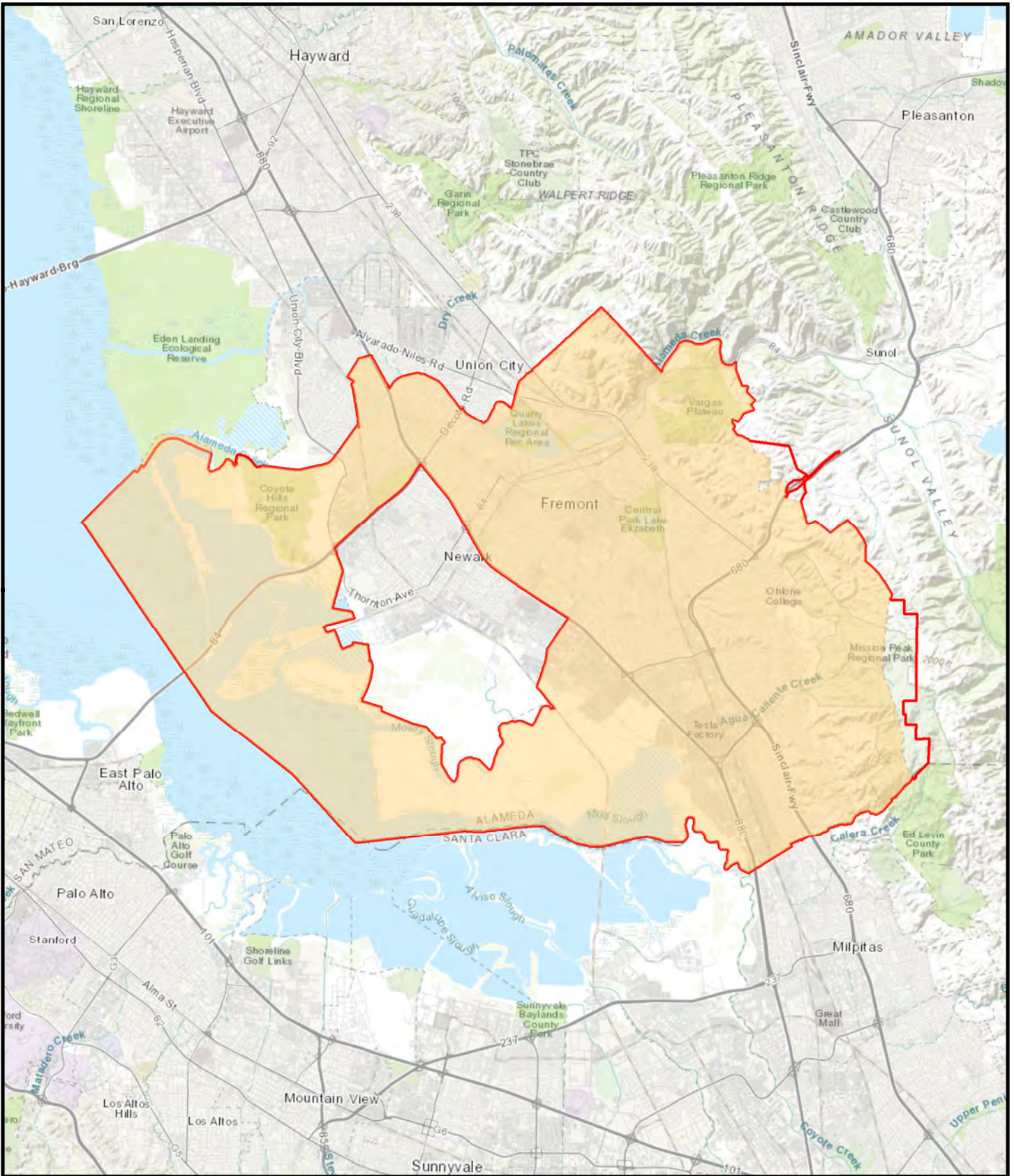
City of Emeryville

City Boundary Sphere of Influence



QK Sources:
ESRI Sources: Esri, HERE,

November 2021



Alameda
LAFCO

City of Fremont

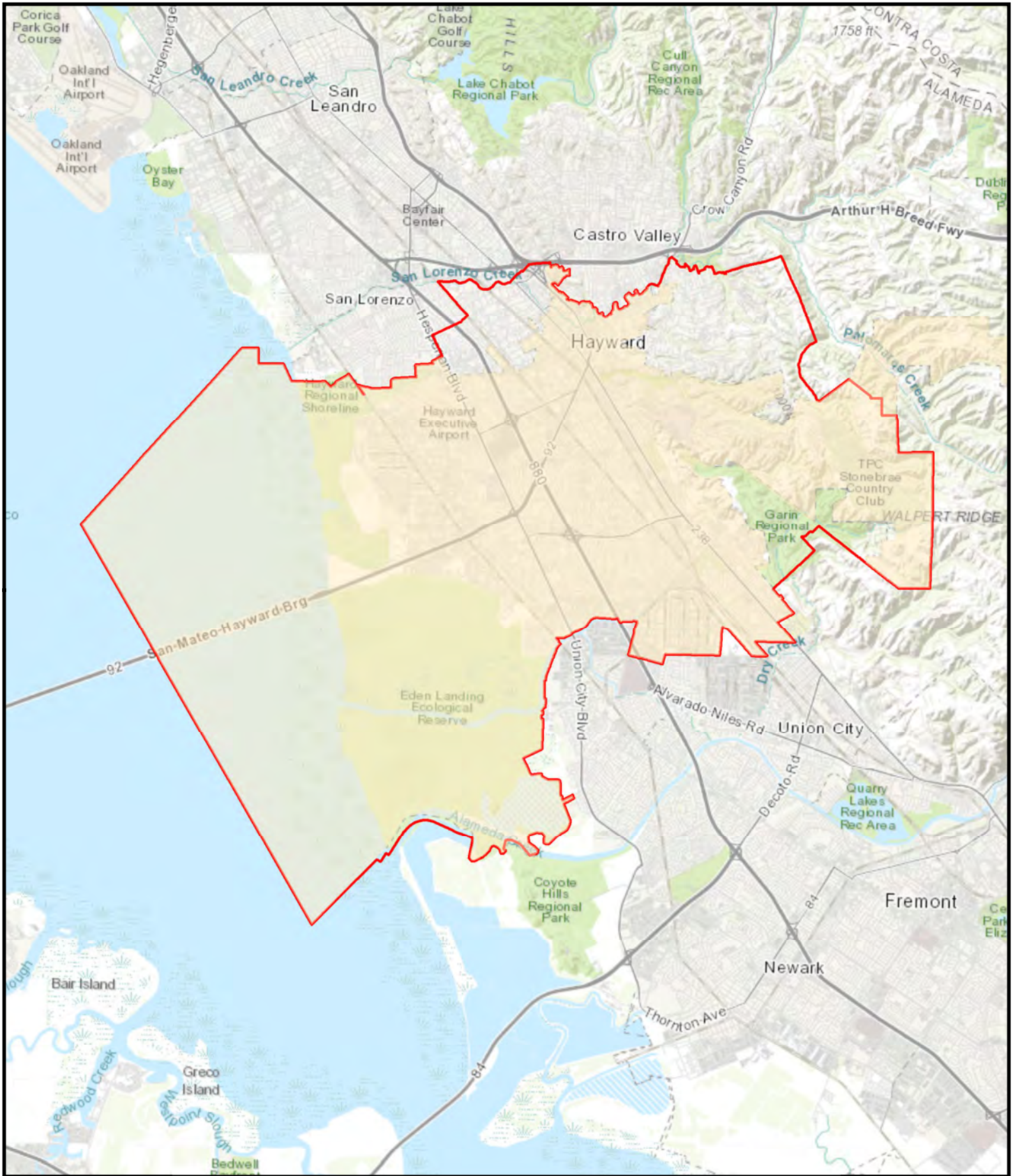
City Boundary Sphere of Influence



0 Miles 2.5

QK Sources:
ESRI Sources: Esri, HERE,

November 2021



**Alameda
LAFCO**

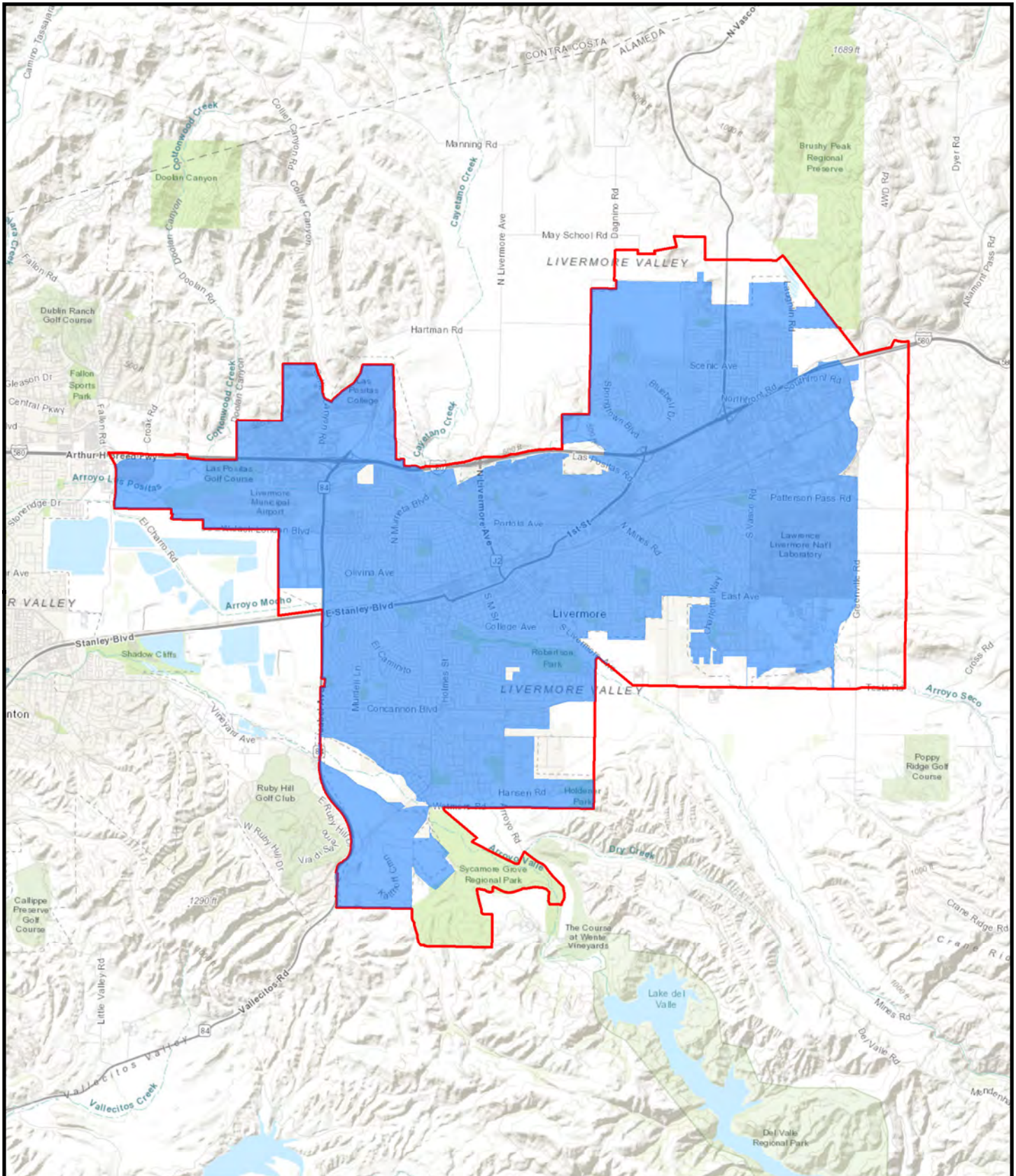
City of Hayward

City Boundary Sphere of Influence

November 2021



QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

City of Livermore

City Boundary
 Sphere of Influence



0 Miles 1.5

November 2021

QK Sources:
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

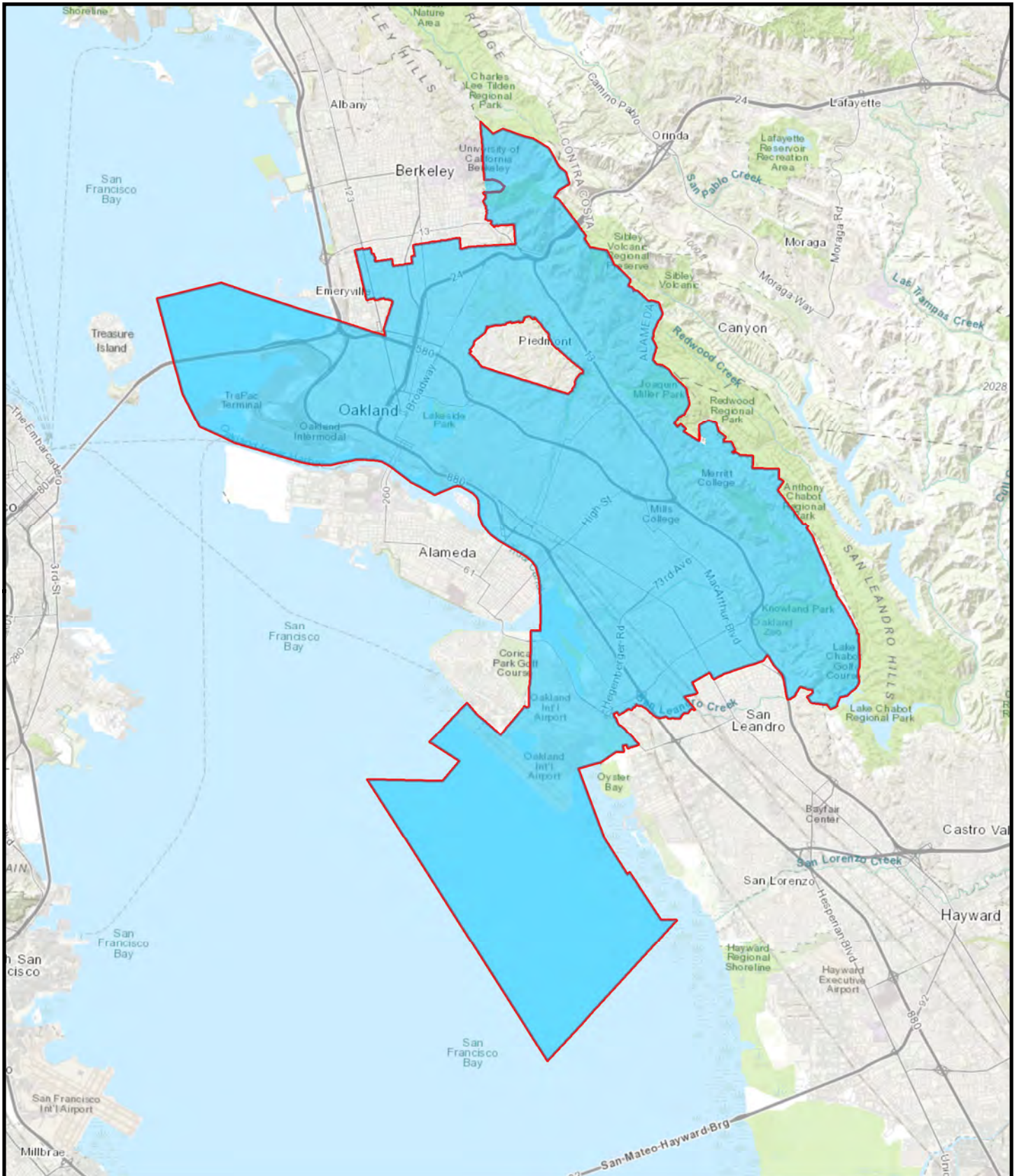
City of Newark

City Boundary
 Sphere of Influence



November 2021

QK Sources:
 ESRI Sources: Esri, HERE



**Alameda
LAFCO**

City of Oakland

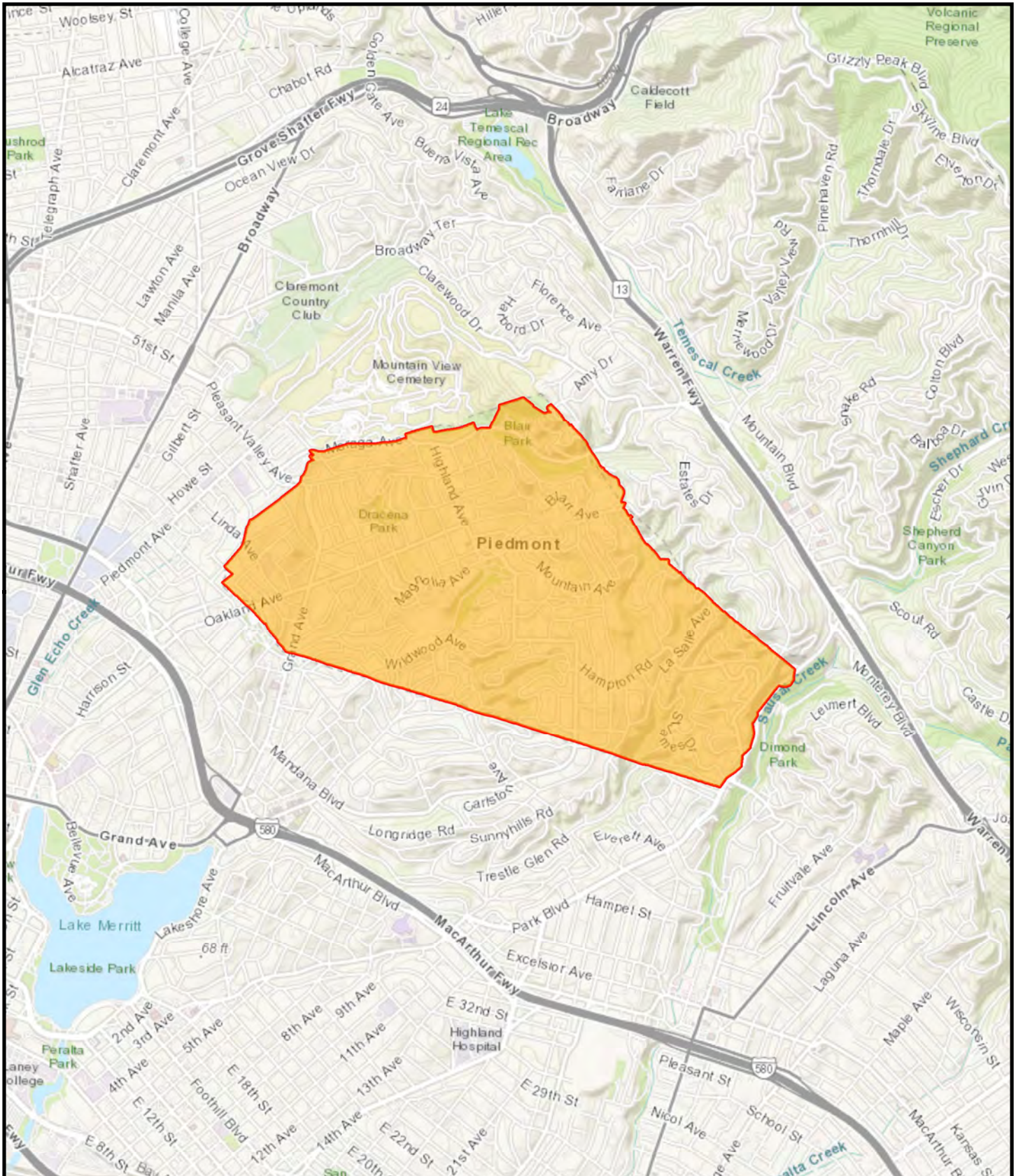
City Boundary
 Sphere of Influence



0 Miles 2.5

November 2021

QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

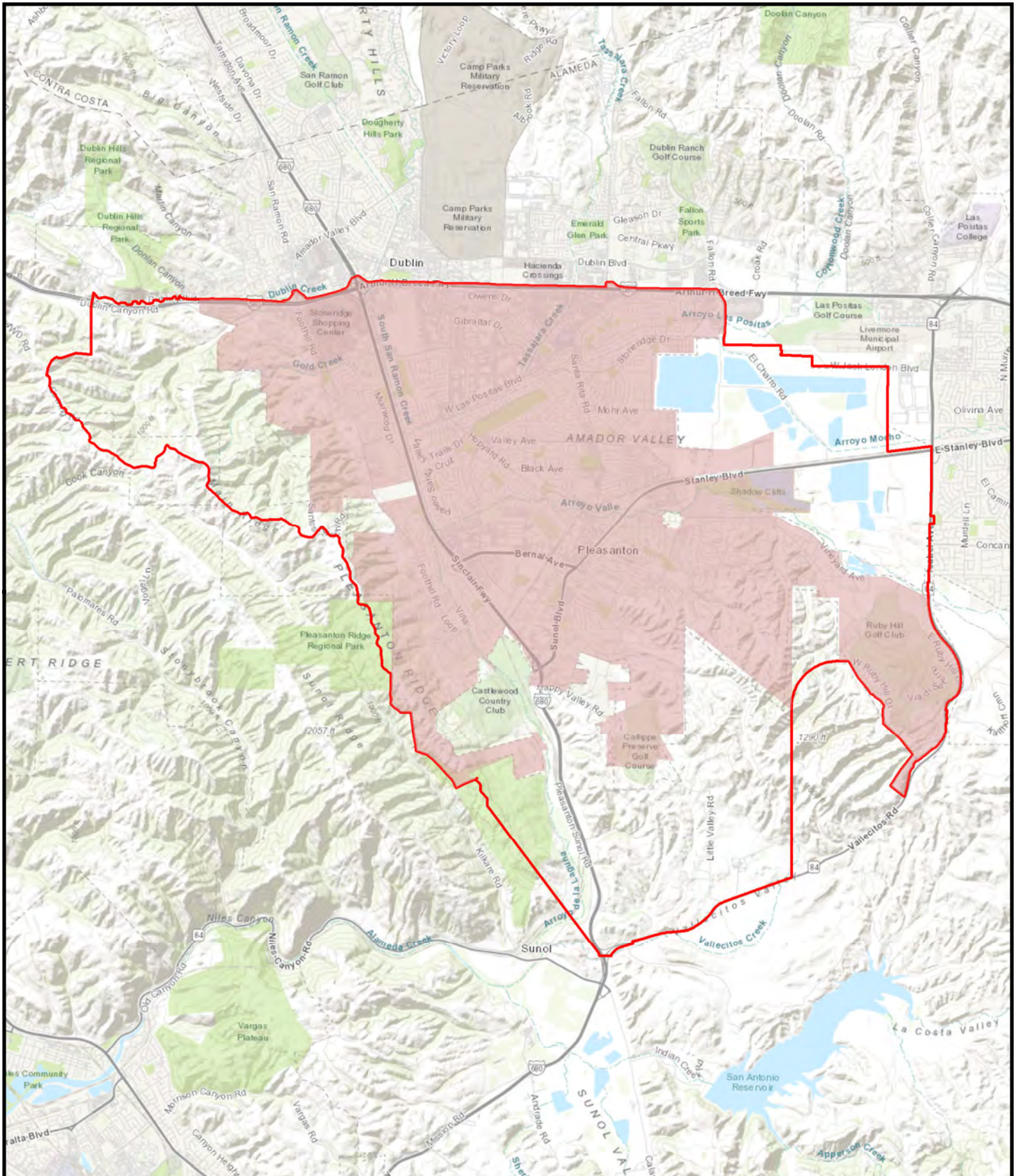
City of Piedmont

City Boundary Sphere of Influence



November 2021

QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

City of Pleasanton

City Boundary
 Sphere of Influence



0 Miles 1.5

November 2021

QK Sources:
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

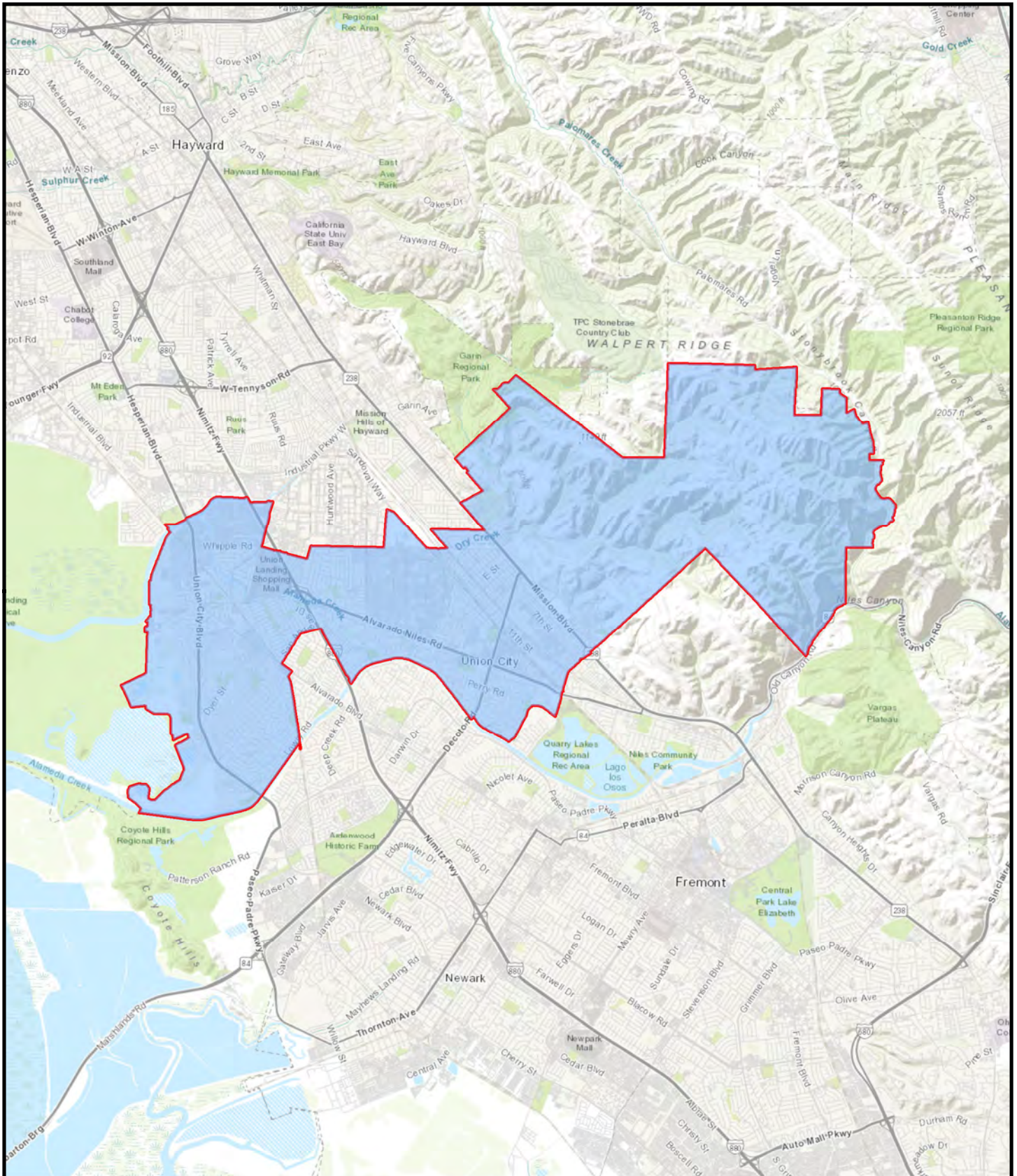
November 2021

City of San Leandro

City Boundary
 Sphere of Influence



QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

City of Union City

City Boundary
 Sphere of Influence



November 2021

QK Sources:
ESRI Sources: Esri, HERE,

APPENDIX B
SPECIAL DISTRICT MAPS



**Alameda
LAFCO**

Alameda County Flood Control and Water Conservation District

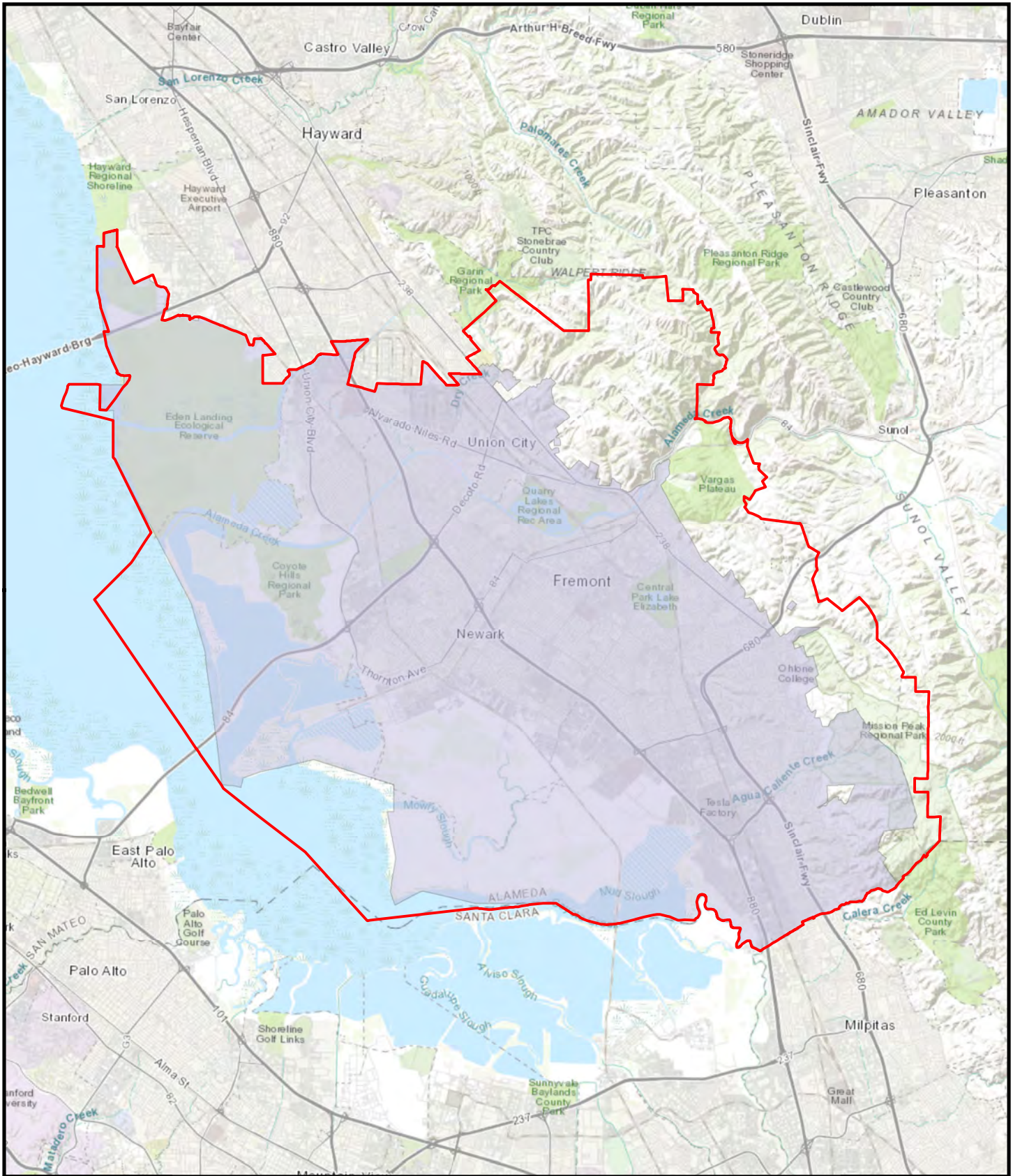
District Boundary
 Sphere of Influence

November 2021



0 Miles 7.5

QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

Alameda County Water District

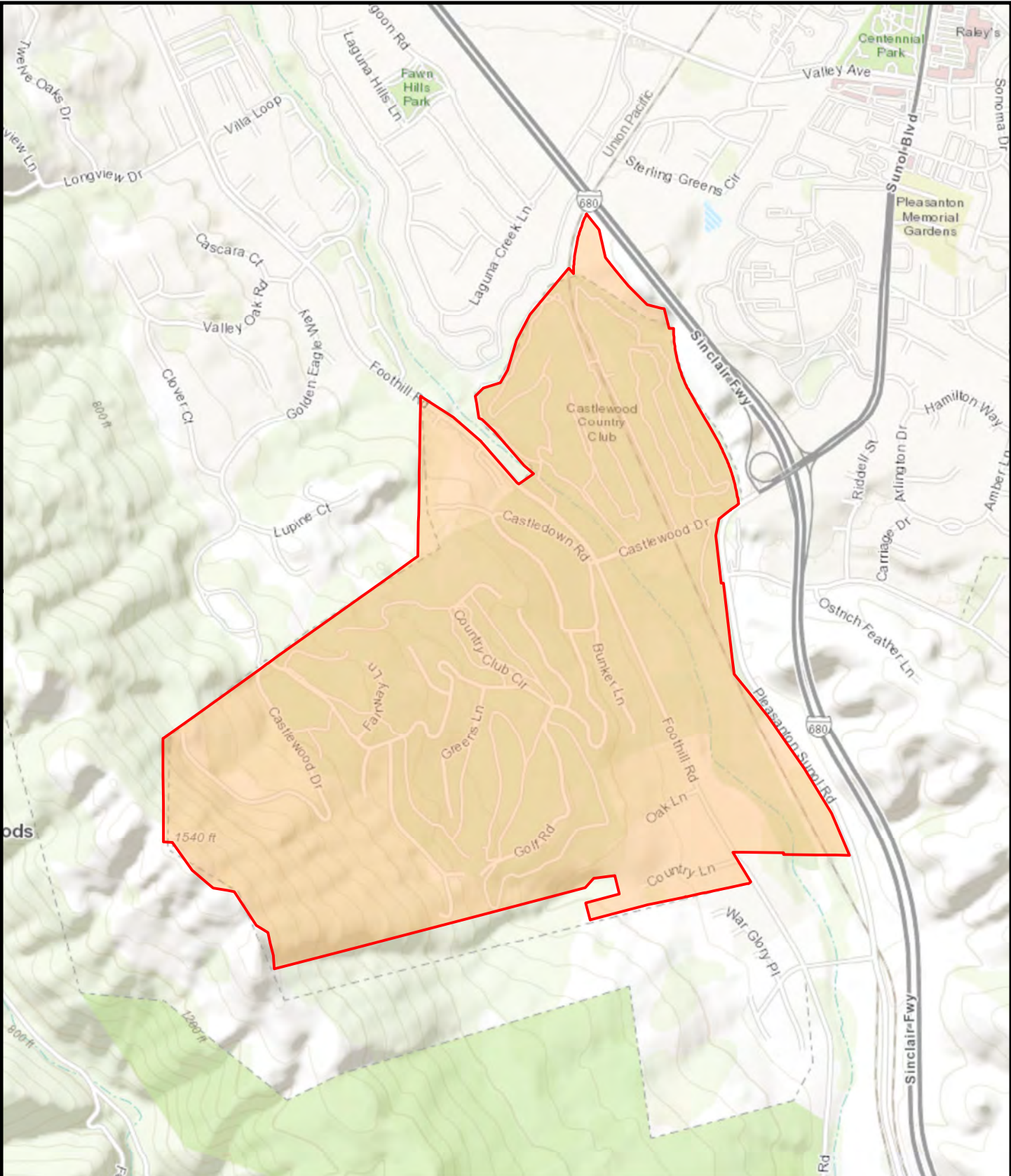
District Boundary
 Sphere of Influence



0 Miles 2.5

November 2021

QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

Castlewood County Service Area

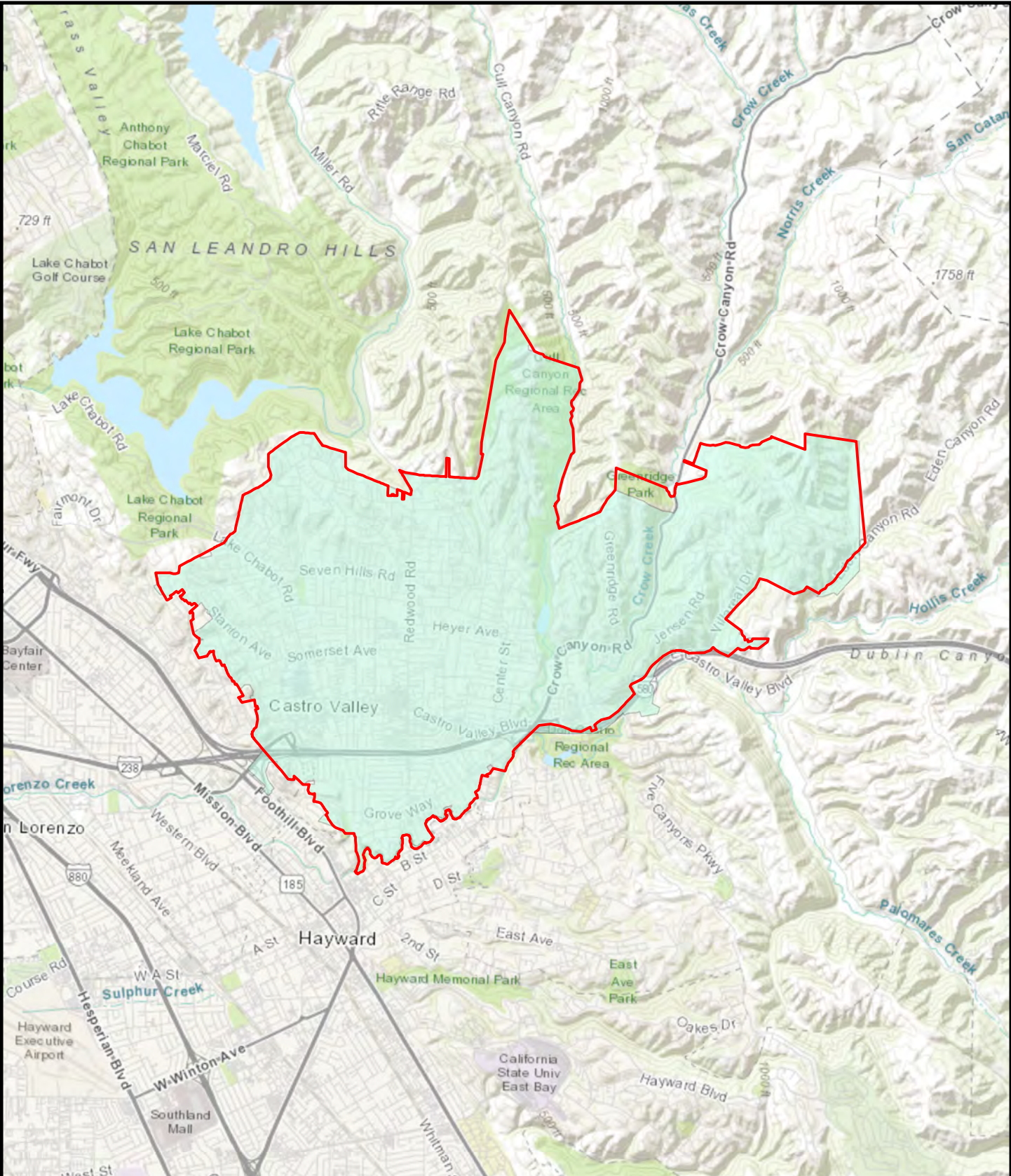
Service Boundary
 Sphere of Influence



0 Miles 0.25

QK Sources: Esri, HERE

November 2021



**Alameda
LAFCO**

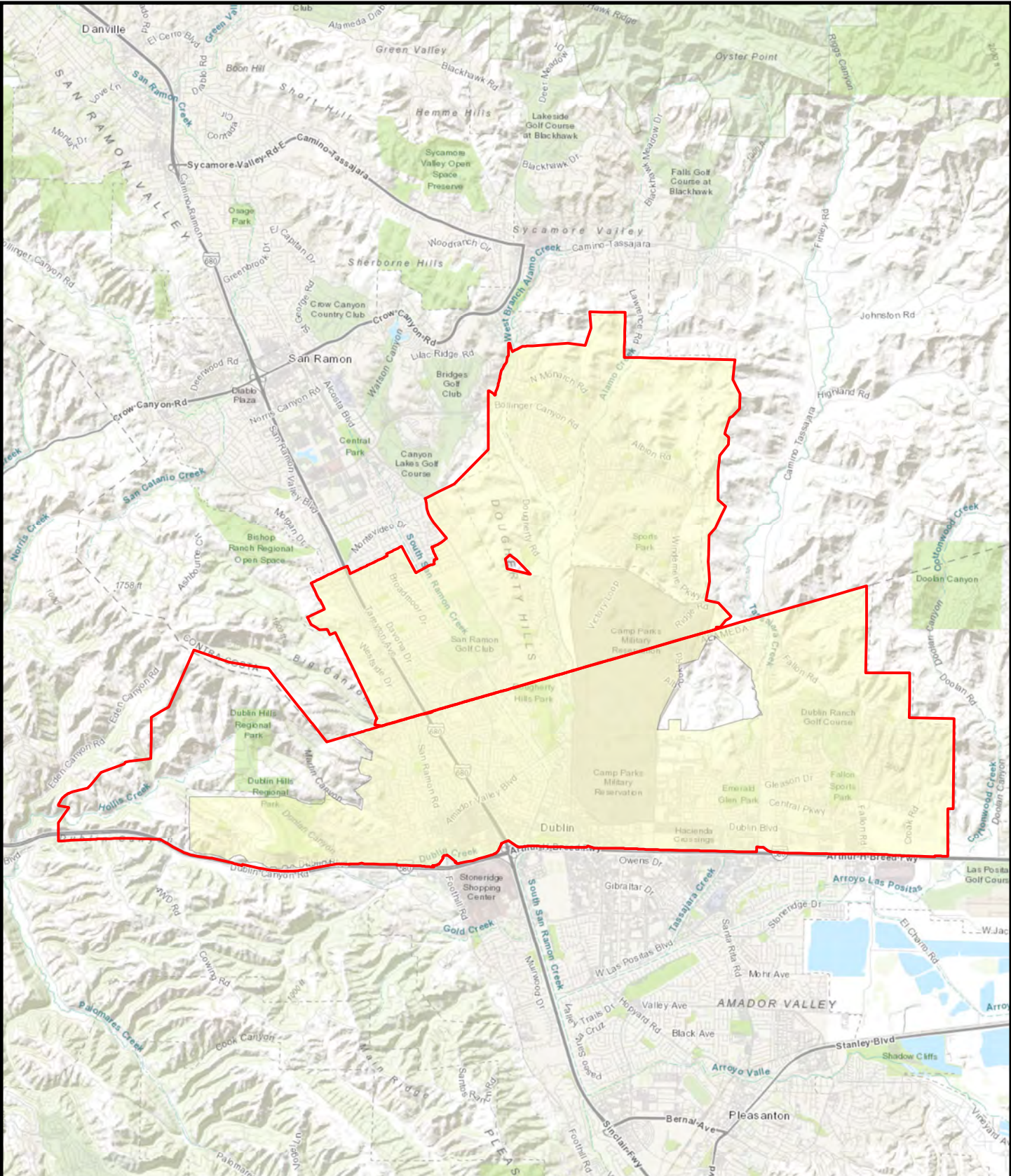
Castro Valley Sanitary District

District Boundary
 Sphere of Influence

November 2021



OK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

Dublin San Ramon Services District

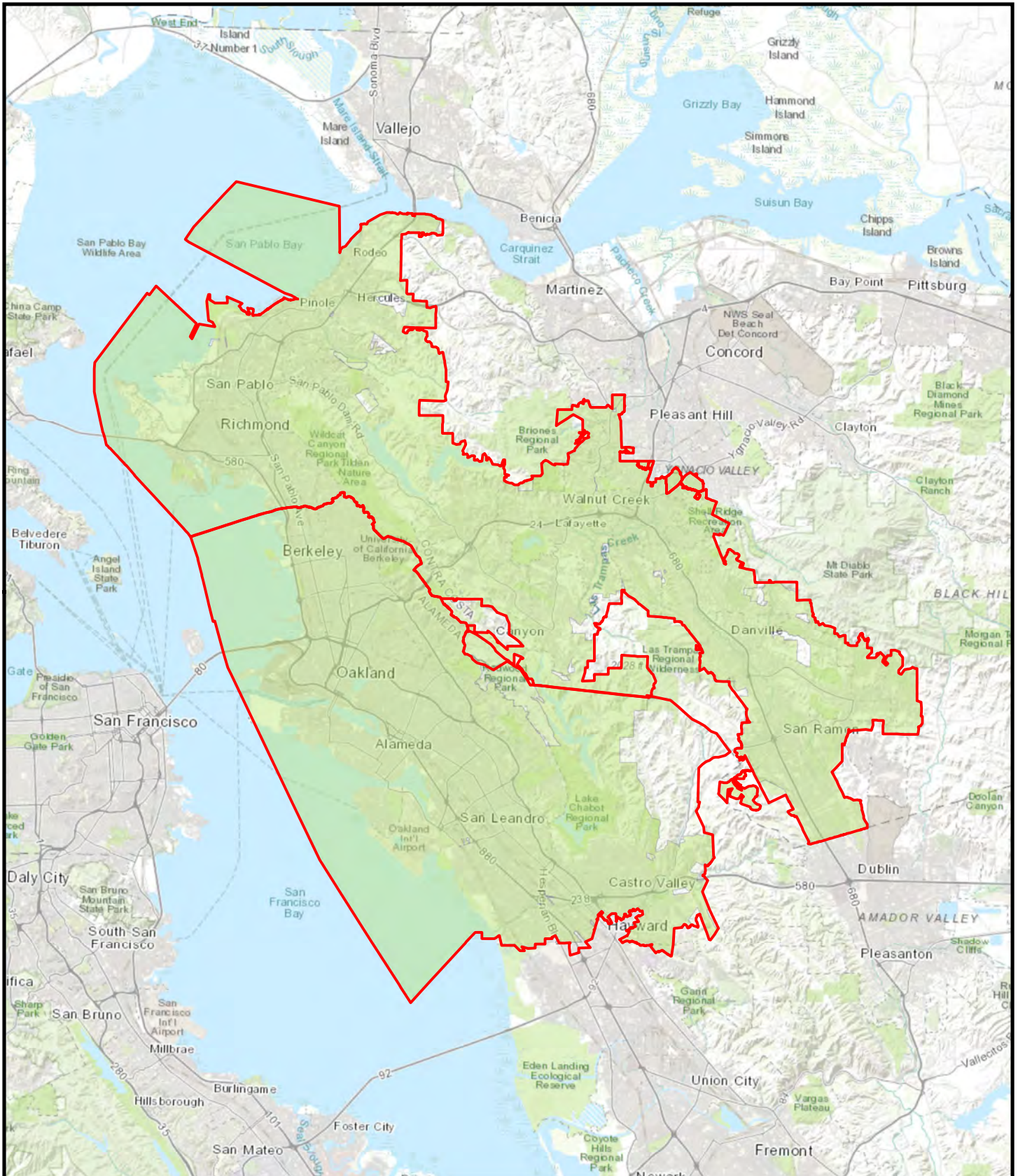
Service Area
 Sphere of Influence

November 2021



0 Miles 1.5

QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

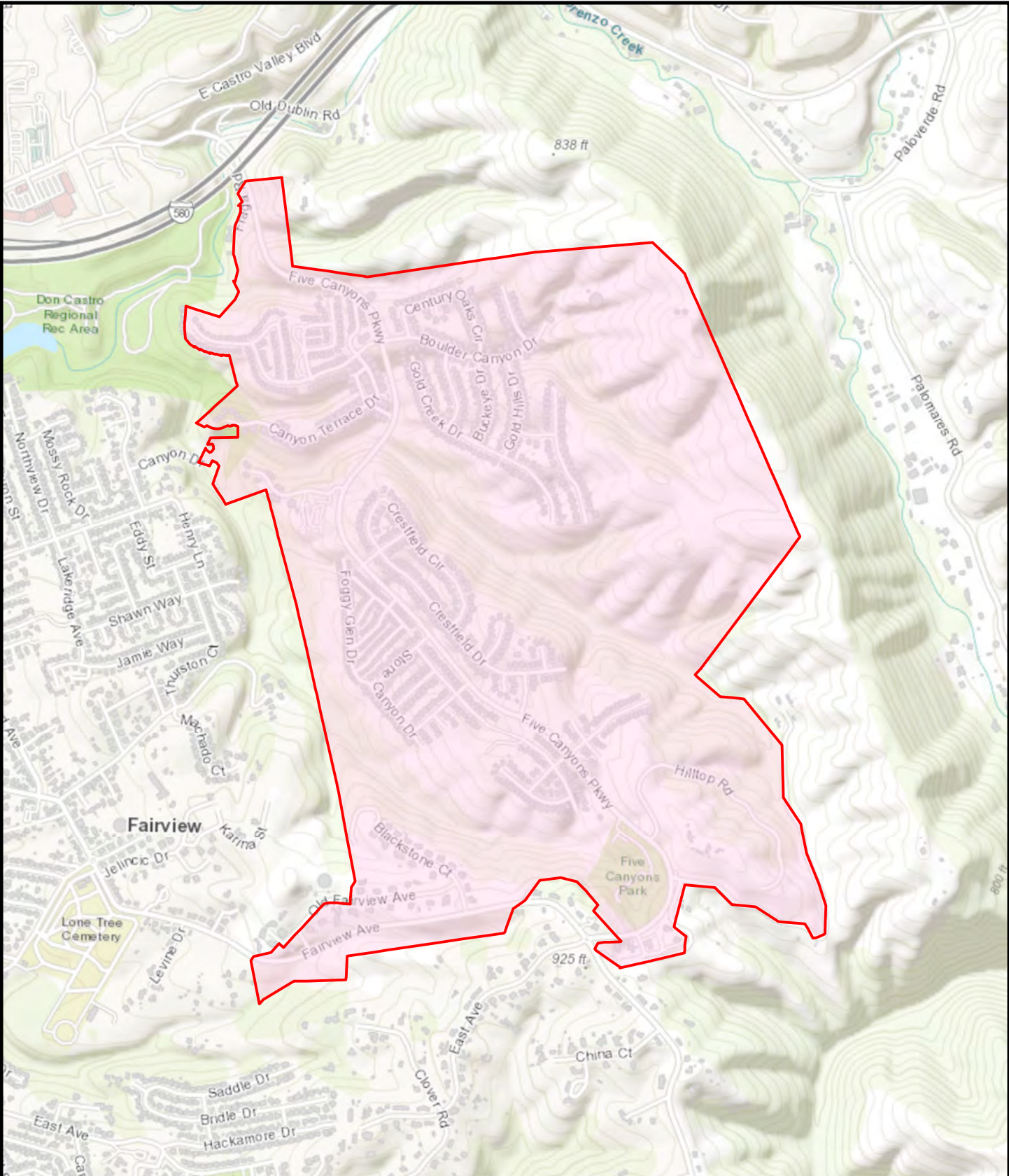
East Bay Municipal Utility District

District Boundary
 Sphere of Influence



November 2021

QK Sources:
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

Five Canyons County Service Area

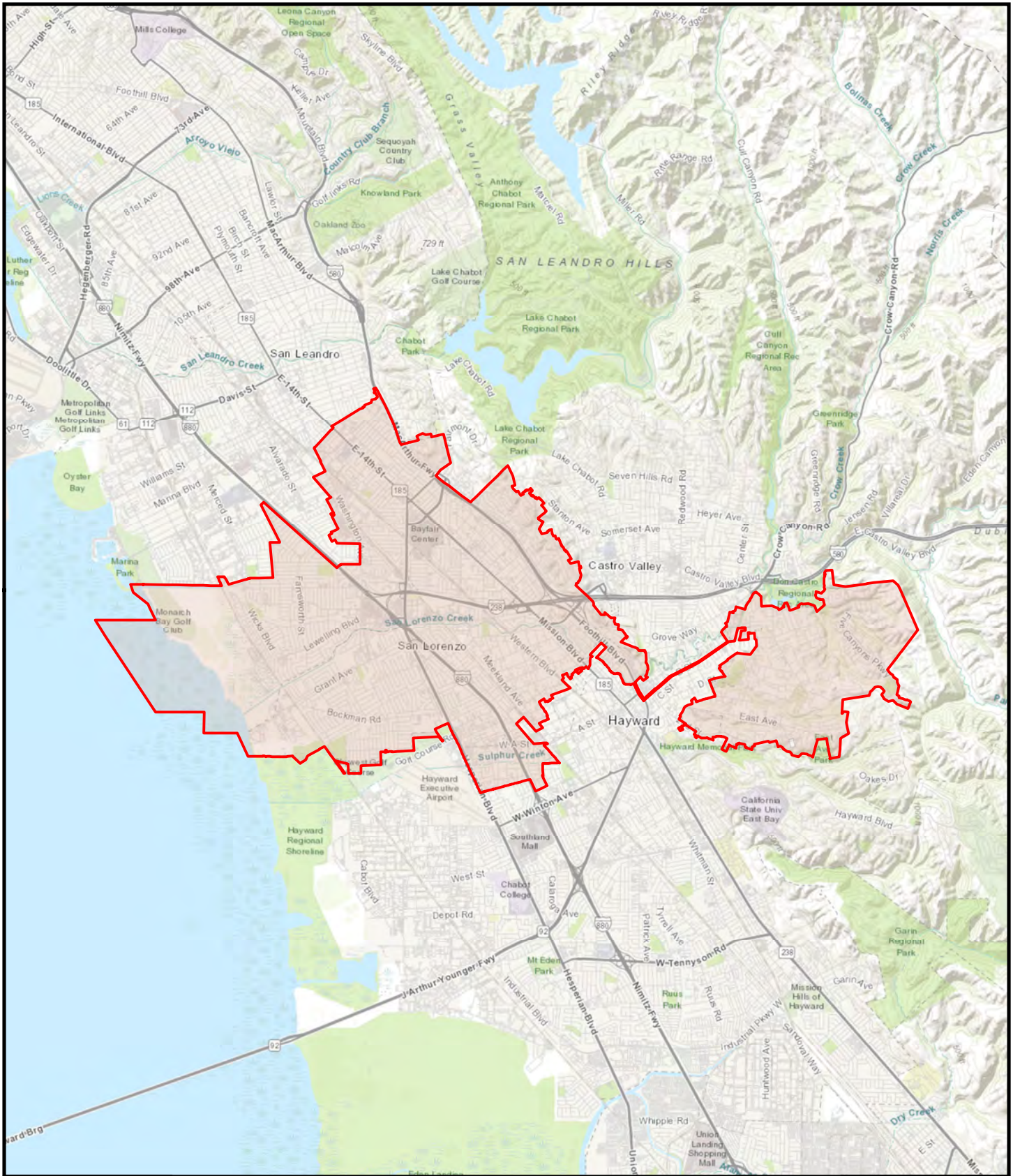
Service Boundary
 Sphere of Influence



0 Miles 0.25

QK Sources:
ESRI Sources: Esri, HERE,

November 2021



**Alameda
LAFCO**

Oro Loma Sanitary District

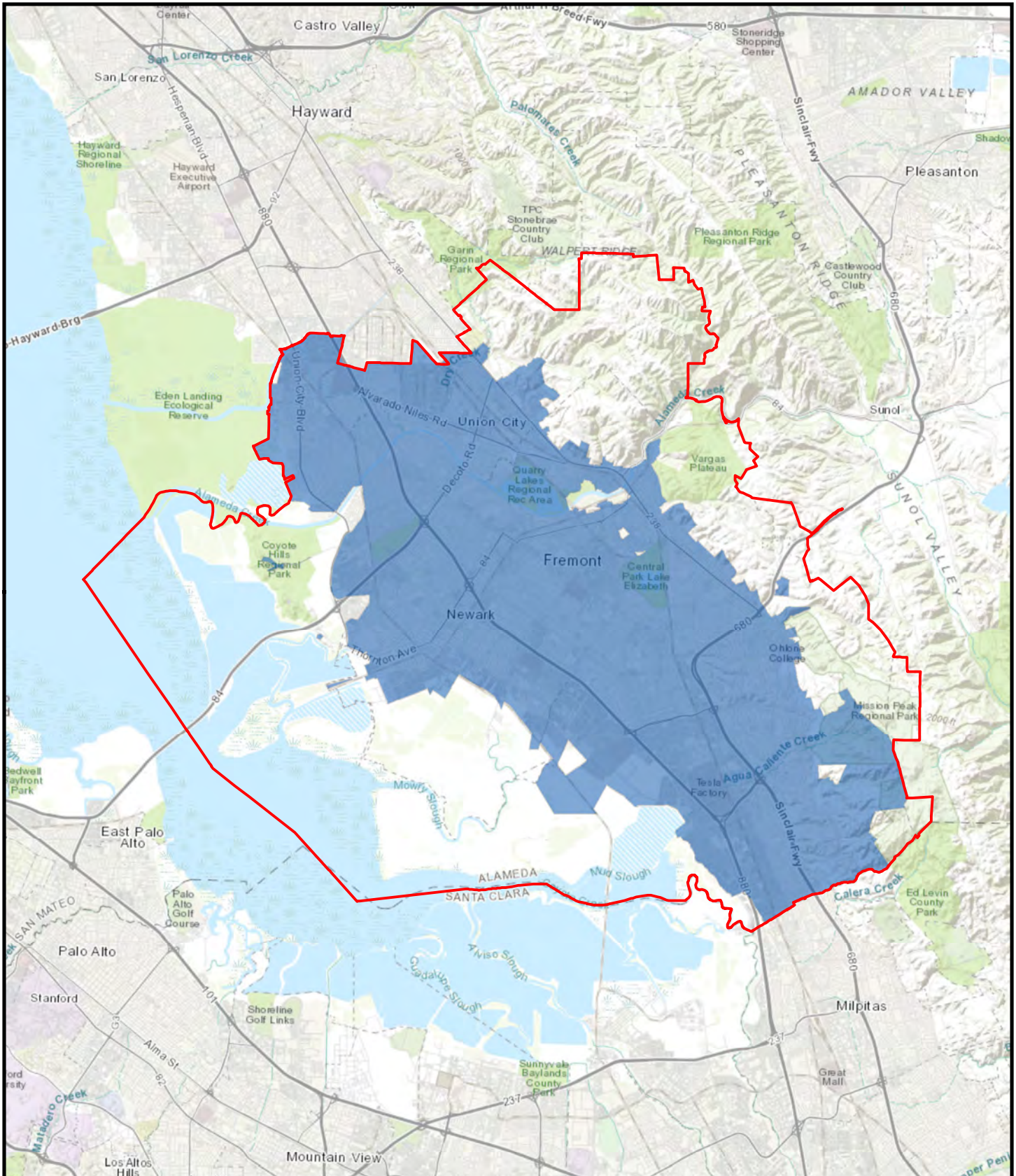
District Boundary
 Sphere of Influence

November 2021



0 Miles 1.5

QK Sources: Esri, HERE,
 ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

Union Sanitary District

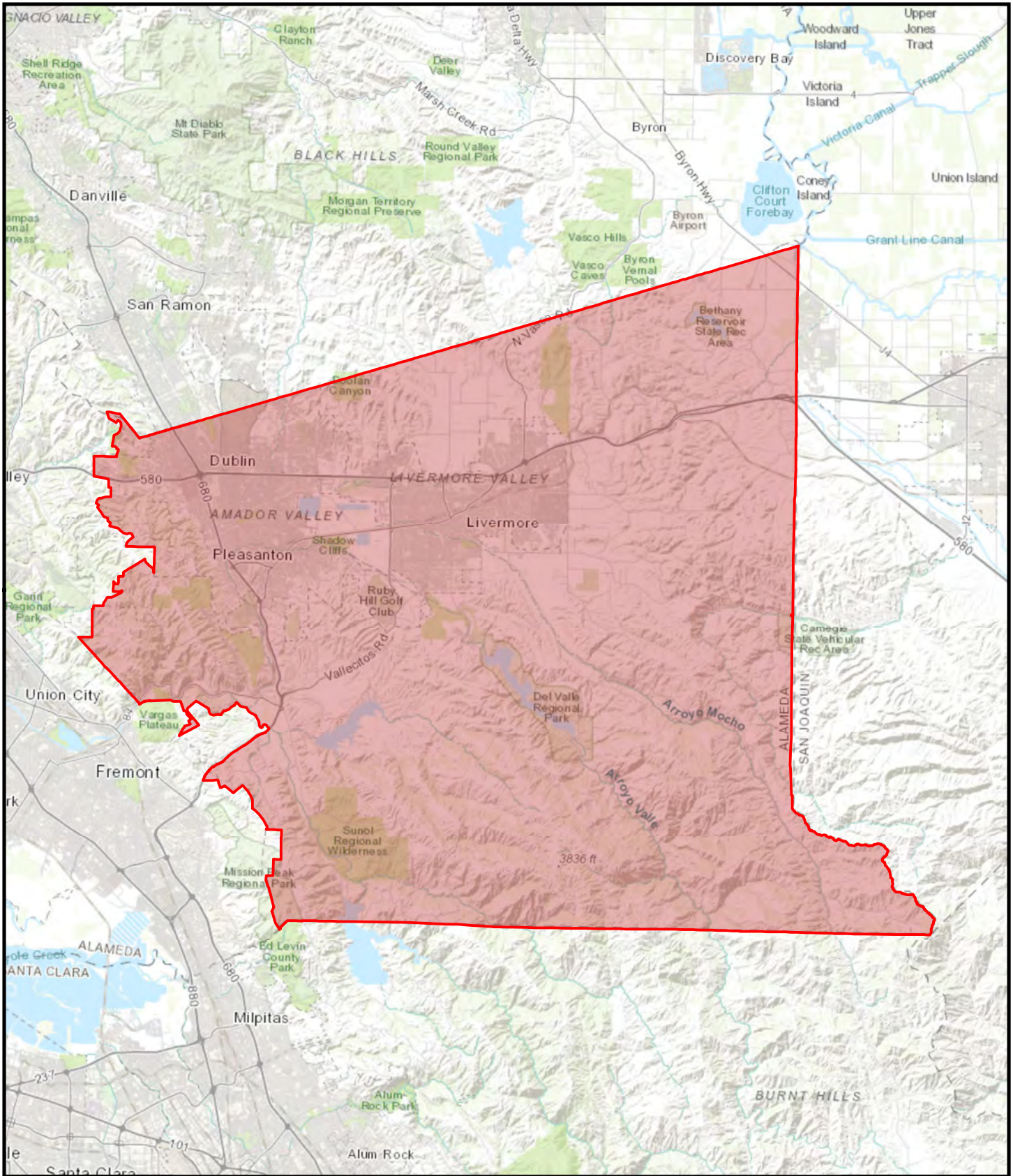
District Boundary
 Sphere of Influence



0 Miles 2.5

November 2021

QK Sources:
ESRI Sources: Esri, HERE,



**Alameda
LAFCO**

Zone 7 Water Agency

Agency Boundary
 Sphere of Influence

November 2021



QK Sources:
ESRI Sources: Esri, HERE,