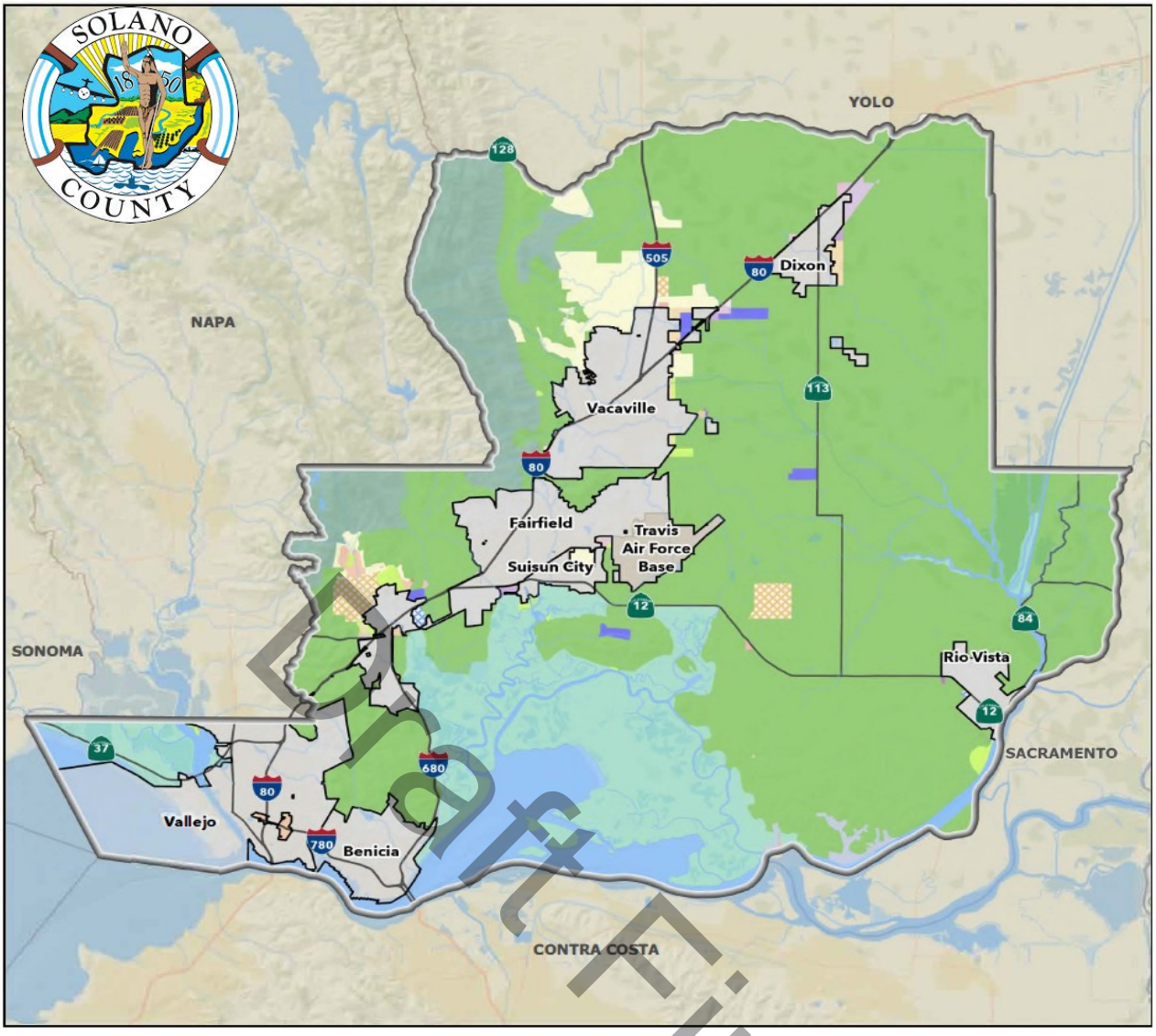
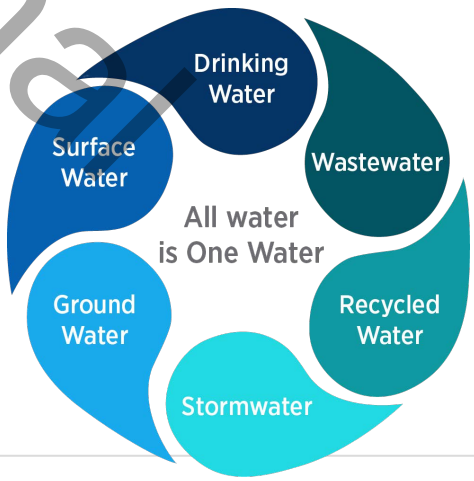


Solano County,
Department of Resource Management



Solano One Water:
Integrated Water Resources Implementation Framework

KJ 2368003*00

November 2025

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Solano One Water
Integrated Water Resources Implementation Framework
Final

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List of Acronyms

%	percent
AF	Acre Feet
AFB	Travis Air Force Base
AFY	acre-feet per year
ARPA	American Rescue Plan Act
ASV-20	Suisun Valley Agricultural District
ATCs	Agriculture Tourist Centers
Cal Water	California Water Service
CalTrans	California Department of Transportation
CASGEM	California Statewide Groundwater Elevation Monitoring
CCCC	City County Coordinating Council
cfs	cubic feet per second
CKH Act	Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000
County	County of Solano
CPUC	California Public Utilities Commission
CSD	Community Services District
CVFPP	Central Valley Flood Protection Plan
DDW	Division of Drinking Water
DWMP	Dixon Watershed Management Plan
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utilities District
EMWD	Eastern Municipal Water District
eWRIMS	Electronic Water Rights Information Management System
FSSD	Fairfield-Suisun Sewer District
GSAs	Groundwater Sustainability Agencies
IRWM	Integrated Regional Water Management
JEPA	Joint Exercise of Powers Agreement
JPA	Joint Powers Authority
KPIs	Key Performance Indicators
LACSD	Los Angeles County Sanitation Districts
LAFCO	Solano Local Agency Formation Commission
LMAs	Local maintaining agencies
LWS	Lakes Water System
MAR	Managed aquifer recharge
MCL	maximum contaminant level
MGD	million gallons per day
MPWD	Maine Prairie Water District
MSR	Municipal Service Review
NMS	Nutrient Management Strategy
NWP	Nutrient Watershed Permit
OGI	Orderly Growth Initiative
OWTS	Onsite Wastewater Treatment Systems

POE	point-of-entry
PWS	public water system
RCDs	Resource Conservation Districts
RNVWD	Rural North Vacaville Water District
RWQCB	Regional Water Quality Control Board
SAFER	Safe and Affordable Funding for Equity and Resilience
SAGBI	Soil Agricultural Groundwater Banking Index
SCWA	Solano County Water Agency
SEP	Stakeholder Engagement Plan
SFV Basin	Suisun-Fairfield Valley Basin
SGMA	Sustainable Groundwater Management Act
SID	Solano Irrigation District
SLFRF	State and Local Fiscal Recovery Funds
SSWA	Suisun-Solano Water Authority
SWA	Solano Water Authority
SWAC	Solano Water Advisory Commission
SWP	State Water Project
SWRCB	California State Water Resources Control Board
SWS	Small Water System
TDS	Total Dissolved solids
TIN	Total Inorganic Nitrogen
TMF	technical, managerial, and financial
UWMP	Urban Water Management Plans
VFWD	Vallejo Flood and Wastewater District
VPW	Vallejo Permit Water
WDR	Waste Discharge Requirements
WWTP	wastewater treatment plant
µg/L	micrograms per liter

Background and Executive Summary

Background

The Solano County One Water Framework was developed to proactively address the county's evolving water resource challenges by adopting a holistic and integrated approach to water management. Recognizing the limitations of traditional, fragmented water management practices, the Framework aims to unify various water-related sectors—such as water supply, wastewater, stormwater, and ecosystem management—into a cohesive strategy. This integration seeks to enhance environmental sustainability, economic development, and community well-being within unincorporated Solano County.

The development of the One Water Framework is funded by the County's American Rescue Plan Act (ARPA) Coronavirus State and Local Fiscal Recovery Funds (SLFRF) program. The Solano County Department of Resource Management is leading this initiative through a stakeholder-driven process, ensuring that diverse perspectives and expertise contribute to the Framework's development and implementation.

By fostering regional cooperation and coordination, the Framework aligns with the County's General Plan and supports economic development in unincorporated areas. Through a comprehensive stakeholder engagement process, the Framework identifies goals, objectives, and actions aimed at developing regional solutions and multi-benefit conceptual projects. These efforts address the impacts of climate change and the increasing complexities associated with water management, ultimately guiding policy planning and resource management decisions for the county.

The Solano County One Water Framework is an integrated water resource management initiative aimed at holistically planning and implementing water supply, drainage improvements, flood protection, wastewater management, and ecosystem enhancements, including nature-based solutions, within unincorporated Solano County. This regional and collaborative approach aligns water resource projects with the Solano County General Plan to promote economic development. The Framework seeks to maximize benefits by utilizing drainage systems to recharge groundwater supplies and enhance ecosystem services, moving away from traditional single-issue projects toward multi-benefit solutions for the community and environment.

Executive Summary

The Solano One Water Framework identifies key regional challenges including aging infrastructure, water scarcity exacerbated by climate change, water quality concerns due to agricultural runoff and urbanization, heightened flood risks from more intense storm events, and ecosystem degradation resulting from habitat loss. However, these challenges present opportunities for integrated planning among municipalities stakeholders, and agencies, adoption of innovative technologies, ecosystem restoration efforts, and enhanced community engagement.

The Framework establishes several goals to guide water resource management in Solano County: ensuring reliable and resilient water services through infrastructure upgrades; achieving sustainable water supply via conservation and diversification; improving water quality by

reducing pollutants; enhancing flood protection with strategic infrastructure and land-use practices; restoring and protecting ecosystems to bolster ecological health; and fostering inclusive and informed communities by engaging residents in water management decisions.

The Framework also establishes guiding principles, outlines implementation actions, and proposes conceptual projects that demonstrate integrated solutions in practice. These conceptual projects serve as models to inform a water resources component for the future Solano County Utilities Master Plan, which will provide detailed recommendations on governance, funding, and implementation strategies. By adopting this integrated approach, Solano County aims to enhance water security, improve resilience to climate impacts, and promote sustainable development, paving the way for a regenerative and equitable water future.

Benefits of Regional Planning and Implementation

Planning and implementing projects at a regional scale offer several specific benefits:

- **Maximizes Regional Potential**: Planning solely for the unincorporated County would limit water utility services to those the County could provide. Conversely, focusing only on urban areas would overlook opportunities that rely on unincorporated County resources, such as open spaces, recreational amenities, and groundwater recharge areas. In Solano County, urban areas contribute facilities and workforce capacity, while the unincorporated areas provide land, agricultural, and natural resources that support broader regional needs. **Addresses Climate Change Across Jurisdictional Boundaries**: Impacts of sea level rise, increased temperatures, and more intense rainfall and runoff events will affect cities but will not stop at city boundaries. Therefore, effective climate change planning must consider not only the area of interest but also the surrounding region.

- **Encourages Collaboration Over Competition**: Without coordinated planning, one area might develop in ways that hinder the development of surrounding areas or displace undesirable effects to nearby regions, creating competition among neighbors. Through collaborative regional planning, entities can share resources and avoid detrimental outcomes as a unified region.

- **Increases and Diversifies Funding Opportunities**: Plans and projects that offer multiple benefits across various jurisdictions are more competitive for state, federal, and regional funding opportunities. Additionally, sharing resources can lead to economies of scale, making projects more cost-effective.

By building upon existing successful regional planning efforts that the county has been involved with and adopting the One Water approach, Solano County aims to enhance water security, improve resilience to climate impacts, and promote sustainable development, paving the way for a regenerative and equitable water future.

Section 1: Introduction to the Region

1.1 Introduction to the Region

The County of Solano (County) is one of California's original 27 counties. Solano County became a legal entity on 18 February 1850 by the first elected legislature of the territory of California. The County covers 933 square miles, spanning from California's Bay Area to California's Central Valley. As shown on Figure 1-1, Solano County is bordered by Marin, Sonoma, and Napa counties to the west; Yolo County to the northeast, Sacramento County to the east, and Contra Costa County to the south. The County is home to significant water and watershed related resources including San Pablo Bay, Grizzly Bay, Suisun Bay, Honker Bay, Broad Slough, Sherman Lake, and the Sacramento River.

There are seven incorporated cities within Solano County. Incorporated cities exercise land use authority and provide public services within their city limits. Beyond city limits, but within the County boundary, the County of Solano exercises land use authority. Solano County, like other California counties, provides an array of municipal services such as roads, parks, law enforcement, emergency response services, and libraries. Counties also serve as a delivery channel for many State services, such as education, foster care, public health care, criminal justice, and elections.

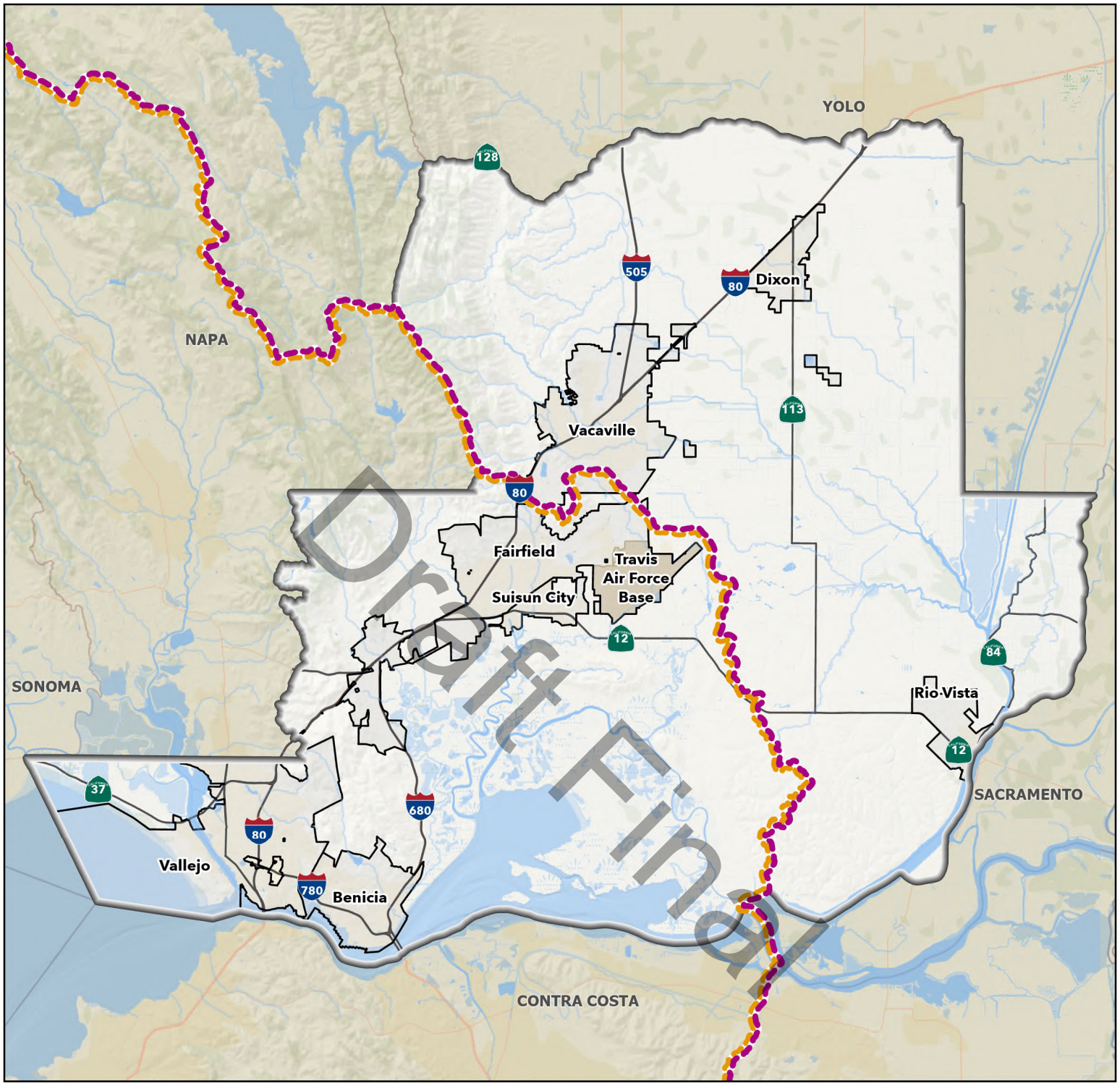
1.1.1 Land Use

The Solano County's Land Use Goals are documented in the County of Solano General Plan. The Land Use chapter of the General Plan describes present and planned land uses and their relationship to long term future goals. The stated vision for land use in the County is:

- "promoting city-centered development consistent with longstanding County policy that 'What is urban shall be municipal'" and
- "sustaining diverse land uses that define the character and identity of Solano County"

(County of Solano 2008a)

Solano County has a "Westside" and an "Eastside" consistent with the County's geography in two watersheds, the Sacramento River watershed to the east and San Francisco Bay watershed to the west. The Westside is the portion of the County that falls under the jurisdiction of the San Francisco Regional Water Quality Control Board (RWQCB) (Figure 1-1), The Eastside, generally considered part of the Sacramento Valley, has mainly flat topography and is located in a portion of the County under the Central Valley RWQCB jurisdiction. The General Plan further subdivides the County into agricultural regions (Section 1.1.1.1 and Figure 1-4).



General Overview Map

Figure 1-1

- Central Valley Regional Board - Westside
- San Francisco Bay Regional Board - Eastside
- Travis Air Force Base
- City Boundary
- Solano County Boundary

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Solano County has a unique set of land uses as shown in Table 1-1 and on Figure 1-2. The land use has been partly driven by the County's location adjacent to the Sacramento-San Joaquin Delta and by a concerted effort to preserve the County's agricultural base. In 1984, Solano County voters approved Measure A, which imposed strict limitations on the conversion of agricultural lands to other land uses. In 1994, Measure A was extended as the Orderly Growth Initiative (OGI) until 2010. In 2008, the OGI was extended as Measure T, coinciding with the adoption of a comprehensive update to the County's General Plan. The primary objective of each of these measures has focused on keeping urban development in existing urban centers and maintaining and supporting agriculture and open space in the County. Specifically, the measures limit the ability of the Board of Supervisors to re-designate agricultural and open space lands to residential or commercial uses without public approval of a ballot measure.

Table 1-1: Solano County Land Uses

	Acres	Square Miles	% of County Land Area
Agriculture	344,107	538	57.61
Water, Marsh, Watershed	152,401	238	25.52
Cities	81,678	128	13.68
Residential	6,878	11	1.15
Industrial	2,125	3	0.36
Public/Quasi Public	1,517	2	0.25
Vacant, Park, Commercial	2,443	4	0.41
Total Unincorporated	**509,471**	**796**	**85.30**
Total Incorporated	**81,678**	**128**	**13.68**
Roads/Railroads	6,105	10	1.02
Total Solano County	**597,254**	**933**	**100**

Source: County of Solano. 2008 County of Solano General Plan as Amended Through March 2023.

Summarized in Table 1-1 and shown on Figure 1-2, land use in the unincorporated area consists mostly of agriculture (58 percent [%] of land area) whereas water, marsh, and watershed[1] areas make up 26% of the total land use in the County. Incorporated cities comprise about 14% of the land area, where a majority of the County's population resides. The population per square mile is generally 2,000-3,000 persons per square mile in the cities and less than 33 persons per square mile in the unincorporated area demonstrating the low population density in the unincorporated County.

General industrial and limited industrial areas make up less than 0.36% of the unincorporated land use area designation. General Industrial allows for manufacturing, processing, and storage. Limited Industrial allows activities such as research institutions, warehousing and distribution, and light manufacturing. Specifically, there is a Limited Industrial area northeast of Dixon, whose uses are limited to those related to agriculture. Compared to neighboring counties such as Napa and Yolo[2], Solano maintains a similarly high share of agricultural and open space

[1] As defined in the Solano County General Plan (2008a), "Water" is "…major waterways and lakes located within the county", "Marsh" is land use that "provides for protection of marsh and wetland areas", and ."Watershed" is an agricultural designation intended for the protection of water quality by limiting development where such development could significantly degrade surface water quality and is typically comprised of hills and mountainous areas used primarily for grazing.

[2] County of Yolo, Land Use Data – Yolo Subbasin, 2023 and County of Napa General Plan Update – Agriculture and land Use, 2007.

lands, but with a larger proportion of water, marsh, and watershed areas and a more compact urban footprint.

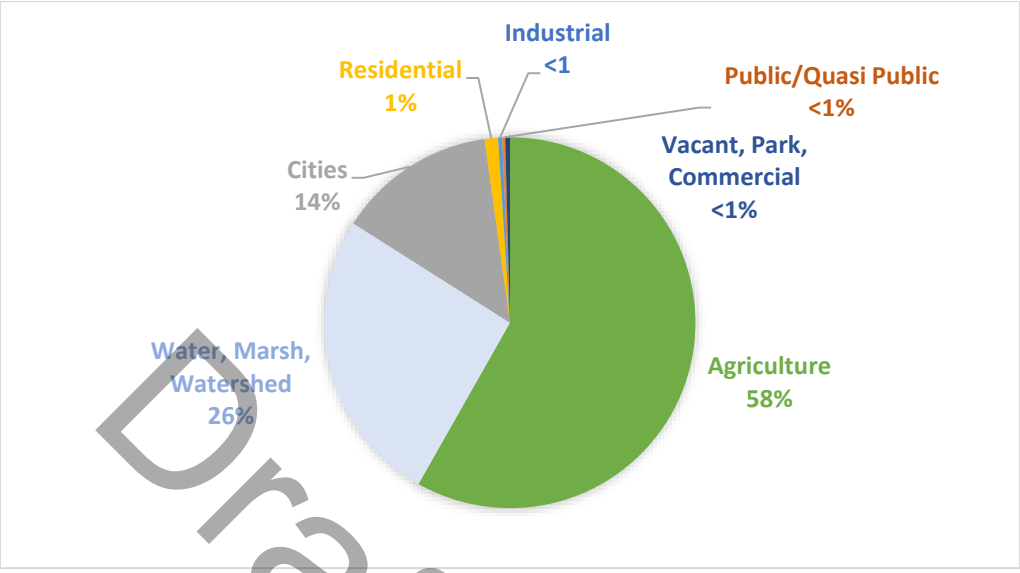


Figure 1-2: Land Use Types –Solano County

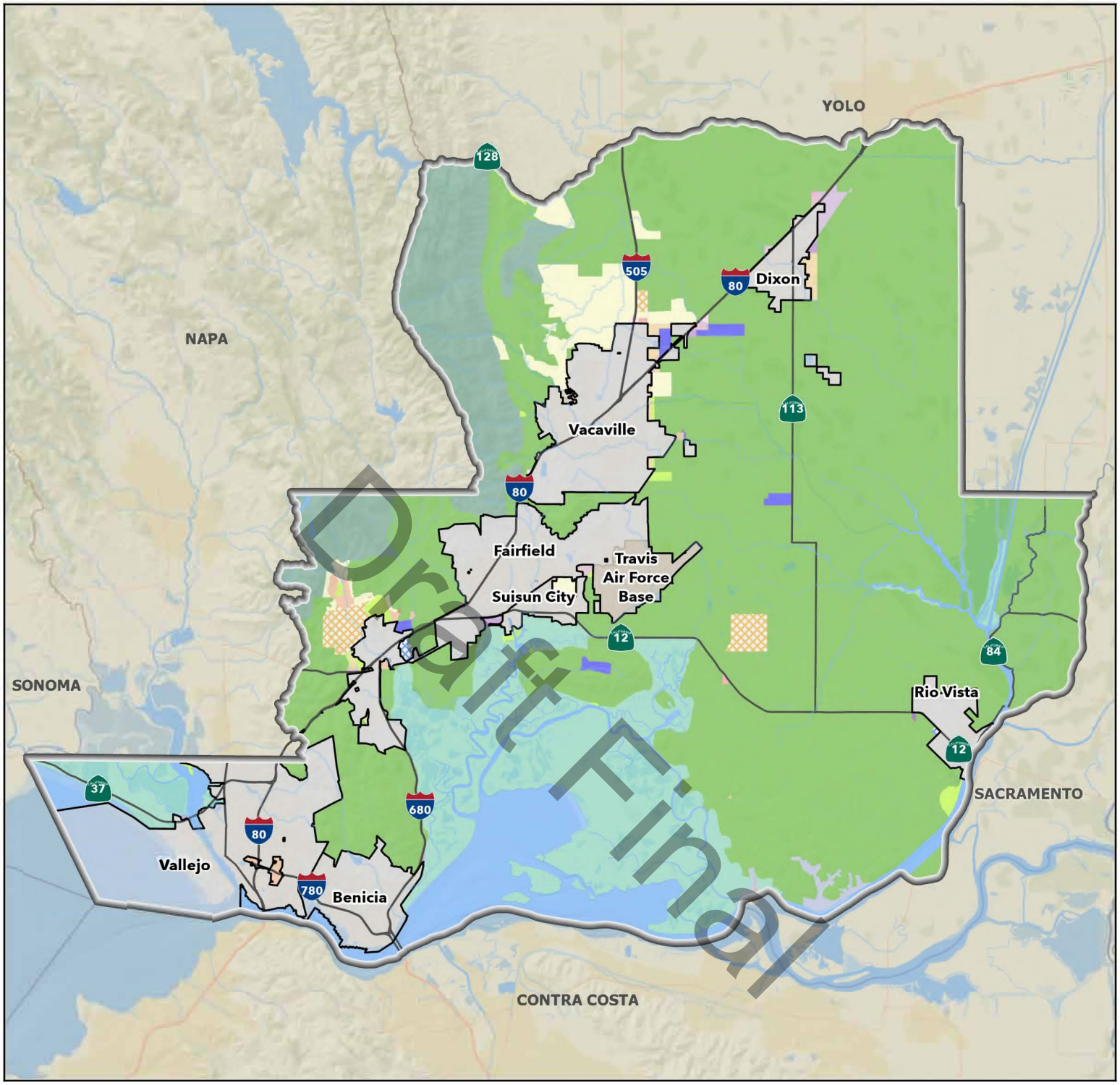
1.1.1.1 Agricultural Land Uses

Solano County is a "right to farm" county, meaning that parts of the Solano County Code protect farm operations from nuisance complaints related to cultivating and tilling the soil, burning agricultural byproducts, irrigation, raising crops and/or livestock and applying approved chemicals to fields and farmland. A copy of the "right to farm" ordinance is required to be given during purchases of real property in the County.

The County's vision for agriculture is documented in Agricultural Chapter of the County of Solano General Plan as follows:

- "Ensuring that agriculture endures as an essential part of Solano County's identity and lifestyle;
- Maintaining and promoting agriculture as an important business and major contributor to Solano County's economy;
- Preserving additional values of agricultural land, including its scenic qualities within the rural environment, its role in providing habitat, serving as a buffer against impacts from other land uses, offering recreational opportunities, and functioning as a community separator that defines the county's distinct cities; and
- Providing opportunities for agriculture to serve as an educational tool and tourist draw."

County of Solano 2008a



Solano County General Plan Land Use Designations

- Travis Air Force Base
- City Boundary
- Solano County Boundary

Solano County General Plan

Incorporated

- Incorporated Area

Natural Resource Designations

- Water Bodies and Courses
- Park and Recreation
- Marsh

Agricultural Designations

- Agriculture
- Watershed

Residential Designations

- Rural Residential
- Traditional Community - Residential
- Traditional Community - Mixed Use
- Urban Residential

Commercial Designations

- Neighborhood Commercial
- Commercial Recreation
- Service Commercial
- Highway Commercial
- Urban Commercial

Industrial Designations

- General Industrial
- Limited Industrial
- Water Dependent Industrial
- Urban Industrial

Public Designations

- Public Quasi-Public

Special Purpose Area

- Specific Project Area
- Urban Project Area

Figure 1-3

Source: 2008 Solano County Unincorporated General Plan - Solano County Department of Resource Management: https://www.solanocounty.gov/government/resource-management/planning-services/2008-solano-county-general-plan

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The County spans parts of the Bay Area, Sacramento-San Joaquin Delta, Coastal Range, and Sacramento Valley. These different environments support a huge diversity of agricultural products. As noted earlier, the County is typically considered to have ten distinct agricultural regions based on the commodities produced, soil conditions, cultivation practices, and water conditions; the regions are depicted on Figure 1-4 and described below:

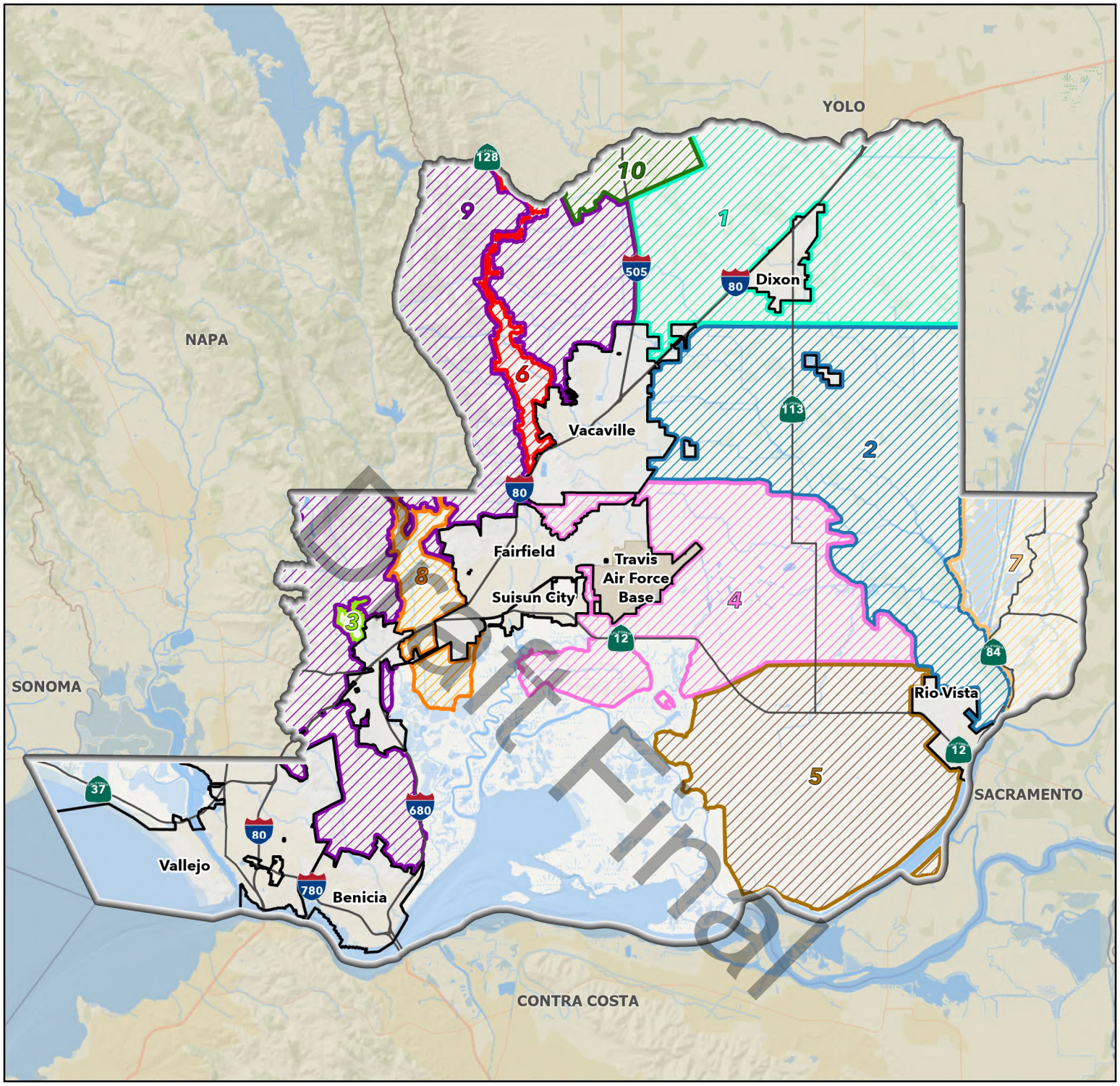
- **Western Hills.** This area is the furthest west agricultural region in the County and has steep slopes and limited water for irrigation. Lot sizes allowed in this area vary from 20 acres to 160 acres. This region is generally used for grazing (County of Solano 2008a).

- **Green Valley.** This area was historically home to small orchards but has transitioned to wine grapes. Green Valley is within the service area of Solano Irrigation District (SID), which currently provides irrigation water to this area through its Green Valley system. Some parcels in Green Valley are served potable water from the City of Vallejo Lakes Water System. Land uses in this area are now regulated by the Middle Green Valley Specific Plan. The plan allows lot sizes to be as small as 1 acre for RTC-1AC zoning and as large as 160 acres for watershed zoning.

- **Suisun Valley.** This area lies along the Interstate 80 corridor. Grapes, grains, vegetables, and fruit crops are grown in this area. The County has identified this area as having the potential for agricultural tourism and specifically as a destination for visitors interested in local wine, farm stands, and a rural atmosphere away from the more developed areas of Napa and Sonoma (County of Solano 2008a). General Plan policy AG.P-29 is to "…encourage the development of complementary agri-tourism, processing, and commercial uses" in this region. Almost all of the Suisun Valley agricultural region is considered to be "Prime Farmland" as defined by the California Department of Conservation. According to the California Department of Conservation, Prime Farmland is "farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agriculture production at some time during the four years prior to the mapping date. Portions of the Suisun Valley are in the SID service area boundary. Minimum lot size in this area is 20 acres. (County of Solano 2008a).

- **Pleasants/Vaca/Lagoon Valleys.** This area has minimum lot sizes of 20 acres and is considered the most diverse agricultural region of the county. It is home to small scale and niche agriculture. Operations in this area vary from wine grapes, nut crops, nurseries, organic produce, as well as horse and livestock. This area includes the SID and Rural North Vacaville Water District service areas. (County of Solano 2008a).

- **Winters.** This area is located along the Interstate 505 corridor and produces primarily walnuts, almonds, and prunes, although the region is transitioning from nut crops to field and other orchard crops due to market changes. Agricultural processing is also prevalent in this area. Almost the entire area of the Winters agricultural region is considered Prime Farmland. Minimum lot size in this area is 40 acres (County of Solano 2008a). Irrigation and drinking water in this area is primarily from private wells.



Solano County Agricultural Regions

- 1 - Dixon
- 2 - Elmira Maine Prairie
- 3 - Green Valley
- 4 - Jepson Prairie
- 5 - Montezuma Hills
- 6 - Pleasants/Vaca/Lagoon Valley
- 7 - Ryer Island
- 8 - Suisun Valley
- 9 - Western Hills
- 10 - Winters
- Travis Air Force Base
- City Boundary
- Solano County Boundary

Figure 1-4

Source: 2008 Solano County Unincorporated General Plan - Solano County Department of Resource Management: https://www.solanocounty.gov/government/resource-management/planning-services/2008-solano-county-general-plan

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- **Dixon Ridge.** This area lies along the Interstate 80 corridor. This area produces crops consistent with the Sacramento Valley such as processing tomatoes, almonds, alfalfa, and sunflower. This region is also home of two large agricultural processors, Campbell Soup and Superior Farms. Almost all of the farmland in the Dixon Ridge area is considered to be Prime Farmland with a small amount of land considered "Unique Farmland". "Unique Farmland" is defined by the California Department of Conservation as "farmland of lesser quality soils used for the production of the state's leading agricultural crops." Minimum lot size in this area is 40 acres (County of Solano 2008a). Irrigation water is provided by Reclamation District 2068, private wells, and surface water diversions. A portion of this agricultural area is within the SID service area.

- **Elmira/Maine Prairie.** This area produces crops such as alfalfa, corn, and wheat that is sold to regional dairies. Some grazing occurs in the southern portion of this region. Minimum lot size in this area is 40 acres. Irrigation water for this area is provided by SID, Maine Prairie Water District and Reclamation District 2068, private wells and surface water diversions. The majority of eastern Solano County's 24,700 acres of irrigated pasture occur in the Elmira/Maine Prairie agricultural area.

- **Ryer Island.** This area in the southeastern part of the County and produces crops tolerant of seasonal spring flooding, with wine grapes, orchards, alfalfa, and processing tomatoes. Minimum lot size in this area 80 acres. Irrigation water for this area comes from private surface water diversions (County of Solano 2008a).

- **Jepson Prairie.** This is an area of low rolling hills and is primarily used for grazing cattle and sheep. The County General Plan is targeting activities, such as food processing and crop sales as a way to improve the farm economy in this area. Minimum lot size in this area is 160 acres (County of Solano 2008a). The eastern most portion of this region is irrigated using private surface water diversions; however, large portions of this area are non-irrigated rangelands.

- **Montezuma Hills.** This area has a mix of grazing and croplands. Sheep and cattle are grazed in a crop rotation system with cultivation of small grains such as barley, oats, and wheat followed by a fallow period. Parts of the area are also used for energy production from wind turbines and natural gas wells. The County General Plan targets activities, such as food processing and crop sales as a way to improve the agricultural economy in this area. Minimum lot size in this area is 160 acres (County of Solano 2008a). The southeastern most portion of this region is irrigated using private surface water diversions; however, large portions of this area are non-irrigated.

As described above, the County is looking to improve farm value, primarily through attracting agri-tourism and uses that support agriculture economy. General Plan Implementation Program AG.I-4 is to:

> "Revise the agricultural zoning districts and other relevant sections of the County code to facilitate agricultural processing facilities and uses by region. Establish an incentive program to encourage development of local processing capacity to serve local and regional markets. The Zoning Ordinance and other relevant sections of the County code shall permit the establishment of limited agricultural support services in areas designated as Limited Industrial and Agriculture.

> Remove barriers to agricultural development by streamlining the permitting process for agriculture-supporting uses, including, but not limited to, barns, farm stands, and agricultural processing plants. Consider creating a separate permitting fee structure for these types of projects to promote investment in agricultural improvements. The updated Zoning Ordinance shall include provisions for incidental recreational use of lands designated for agriculture."
>
> *(County of Solano 2008a)*

Another applicable General Plan program is AG.I-6. The intent of this program is to "minimize the regulatory obstacles to value-added opportunities for local agriculture." The County has specifically zoned a small portion of the County's land for agri-tourism and Limited Industrial use. In the Suisun Valley, the Neighborhood Agricultural/Tourist Center zoning provides for areas supporting complementary agricultural and tourism commercial facilities that are compatible with surrounding agricultural uses. In addition, permitted uses are meant to enhance the agricultural character of surrounding areas, develop brand recognition, and create a destination for tourists. Permitted uses include small hotels, restaurants, retail shops, and facilities for the sale of local produce. The County's Land Use Plan has designated 75 acres for Neighborhood Agricultural/Tourist Center in the Suisun Valley area (Figure 2-6).

The Limited Industrial Land Use allows industrial operations of relatively low intensity and with minimal environmental impact (low polluting character). Where this applies is mostly northeast of the City of Dixon (see Figure 2-7), uses must support agriculture and include activities such as the storage or sales of products for commercial agriculture, agricultural processing, and yards for the storage and maintenance of agricultural equipment. The County's Land Use Plan has designated 703 acres for Limited Industrial uses.

1.1.2 Demographics

The California Department of Finance estimates a total of 449,839 persons in Solano County, the majority residing in cities with a small portion in the unincorporated County as shown in Table 1-2. Table 1-2 illustrates that about 4% of the overall population resides in the unincorporated County.

Table 1-2: California Department of Finance Population Estimate

Jurisdiction	Population Estimate 1 January 2025
Benicia	26,195
Dixon	20,174
Fairfield	120,720
Rio Vista	10,338
Suisun City	29,036
Vacaville	103,181
Vallejo	122,207
Unincorporated County	17,988
Total County	449,839

Though the County decreased in population from 2021 to 2022, the California Department of Finance anticipates that through natural increase and net migration, Solano County's population will grow by 20 percent to almost 540,000 people by 2060. Projections from both the County of Solano and the California Department of Finance indicate that the population in the unincorporated area is expected to double but will still be relatively minor as compared to incorporated cities (see Figure 1-5) Assuming a distribution of population similar to what occurs today, the unincorporated County would grow from approximately 18,300 persons in 2022 to 39,458 persons by 2060.

Figure 1-5: California Department of Finance Solano County Population Projection

1.1.3 Labor Force and Employment

Since the quality of life experienced by County residents is greatly affected by the local economy, the General Plan includes a chapter on economic development. The General Plan recognizes that, historically, the County's economy has been rooted in agriculture and commerce to meet the needs of Travis Air Force Base (AFB) but realizes future prosperity will depend on diversified businesses and industries, a trained and educated workforce, access to freeways, available housing, and infrastructure to serve businesses. The stated vision for economic development in the County is:

- support for targeted development of manufacturing and office uses (encouraging diverse business opportunities in a variety of industries)
- business recruitment and retention efforts (encouraging businesses that support our communities); and
- education and workforce investment

(County of Solano 2008a)

It is estimated that 58.3 percent of Solano County residents over 18 years of age are in the workforce; this is higher than the percentage seen for California and the United States (California Department of Finance [population] and Bureau of Labor Statistics [labor force], 2021). The County serves as a link between the Bay Area, Central Valley, and wine-producing regions through well-developed highway connections to all these locations. More people commute out of the County than work within the County, meaning the County has a "ready" labor force.

Travis AFB is one of the largest employers in the County, along with healthcare; many of the other business sectors are related to agriculture (transportation and warehousing) (see Table 1-3). Furthermore, some of the conceptual water projects proposed in Section 4 are to support potential growth areas anticipated for economic development.

Table 1-3: Overall County Employment Profile

Highest to Lowest by Annual Payroll	Notable Businesses in County	
Public Administration/Travis AFB	*Manufacturing*	*Food and Beverage*
Healthcare	Dunlop Manufacturing	Anheuser-Busch
Retail Trade	M & G DuraVent	Guittard Chocolate
Manufacturing	Meyer Cookware	Jelly Belly Candy
Construction	Petrochem Insulation	Mariani Packing
Wholesale Trade	UTC Aerospace Systems*	Superior Farms*
Transportation/Warehousing	Valero Refining	Valley Fine Foods
Finance and Insurance	*Biotech*	Caymus Wines*
Leisure and Hospitality	Bio-Rad Laboratories	Campbell Soup*
Professional and Business Services	HemoStat Lab	
Information		

Solano County Economic Development Corporation 2017.
* Denotes business in unincorporated County.

1.1.4 Relationship between County Land Use Authority and Water Resources

The framework for water management in Solano County is complex and reflects the network of laws, policies, and regulations governing California water as summarized in Table 1-4. As is evident in Table 1-4, many laws regulated by local, state, and federal authorities and many institutions influence water resources and water resources planning.

Table 1-4: Framework for Water Management

Statute, Code, or Authority	Relationship to Water Management
California Constitution, Article X, Section 2	Requires all entities in the State use water in a beneficial manner and prohibits unreasonable use and water waste.
Riparian Water Rights	Allows owners of land bordering a lake, river, or stream to divert and use a portion of the flow.
Appropriative Water Rights	The right to divert, store, and use water on any land, provided the use is reasonable and does not harm earlier appropriators. Appropriative rights are managed by the State Water Resources Control Board.
Water Commission Act	Established a system of State-issued permits and licenses to appropriate water.
Federal Endangered Species Act	Designed to protect endangered and threatened species and promote species recovery. Requires federal agencies consult with the US Fish and Wildlife Service and the National Marine Fisheries Service to ensure that federal actions do not jeopardize endangered or threatened species or their habitat.
National Environmental Policy Act	Requires federal agencies to conduct an environmental review for federal actions that may affect the environment; encourages implementation of mitigation measures to avoid impacts.
State Endangered Species Act	Designed to protect endangered and threatened species and promote species recovery. Requires state and local agencies consult with the California Fish and Wildlife Service to ensure their actions do not jeopardize endangered or threatened species or their habitat.
California Environmental Quality Act	Requires state and local governments evaluate environmental effects and mitigate effects where feasible prior to approving projects.
Porter-Cologne Water Quality Control Act	Principal law governing water quality in California and establishes a comprehensive program to protect water quality and beneficial uses of both surface and groundwater. This act allows regulation of discharges to water and groundwater by the Regional Water Quality Control Boards.
Clean Water Act	Requires permits for the discharge of pollutants to waters of the United States from any point source.
Federal and State Safe Drinking Water Act	Under this law, federal and state agencies set and enforce standards for drinking water quality.
Regional and Local Water Agency Formation enabling acts	Guides the formation of districts for controlling, conserving, managing, and distributing water in California.
Urban Water Management Planning Act	Requires urban water suppliers to conduct regular comparisons of supplies and demands. See additional detail below in section 1.1.4.1.
Agricultural Water Management Act	Senate Bill X7-7, the Water Conservation Act of 2009 (SB X7-7), requires agricultural water suppliers who provide water to more than 25,000 irrigated acres (excluding acreage irrigated by recycled water) to adopt and submit Agricultural Water Management Plans and to implement Efficient Water Management Practices, including the measurement and volumetric pricing of water deliveries. SID, RD 2068, and Maine Prairie Water District have prepared Agricultural Water Management Plans.
Water Conservation in Landscaping Act	Requires specific water efficiencies for landscapes in new or redevelopment projects.
California Energy Commission Title 20	Sets standards for toilets, urinals, faucets, and showerheads. The appliance standards dictate what can be sold in California and impacts new construction and replacement fixtures in existing homes.

Statute, Code, or Authority	Relationship to Water Management
CAL Green Building Code	Effective January 2011 requires residential and non-residential water efficiency and conservation measures for new structures that will reduce the overall potable water use by 20 percent. The 20 percent water savings can be achieved by installing plumbing fixtures and fittings that meet the 20 percent reduced flow rate specified in the CAL Green Code, or by other measures to reduce baseline water use by 20 percent.
Sustainable Groundwater Management Act	Requires entities using water from groundwater basins designated as high or medium priority by the Department of Water Resources to assess the condition of groundwater basins and to develop a framework for long-term sustainability through demand management and groundwater recharge activities. See additional detail below in section 1.1.4.2.
State Permitting of Water Systems	Regulates the formation of new public water systems by the State Water Resources Control Board. See additional detail below in section 1.2.8.7.
Solano County Subdivision Ordinance	Regulates and control subdivisions of land and in conjunction implements the County's General Plan. See additional detail in section 1.1.4.3.
County of Solano Well Standards	Regulates construction, maintenance, operation, use, repair, modification, and destruction of groundwater wells.
California Senate Bill 88 (SB 88)	Requires people and organizations that divert water to report annually the amount, timing, and rate of their diversions to the California State Water Resources Control Board (SWRCB).
California Senate Bill 552 (SB 552)	Requires each county to establish a standing county drought and water shortage task force to develop a county drought resilience plan and to facilitate drought and water shortage preparedness for state small water systems (5 to 14 service connections) and individual domestic wells within the county's jurisdiction.

Some of the key, relevant laws, policies and/or regulations are described below.

1.1.4.1 Urban Water Management Plan Act (State)

State law requires that urban water suppliers with more than 3,000 customers or who deliver more than 3,000 acre-feet per year (AFY) adopt water management and conservation plans that evaluate water supplies and water demands for a 20-year period. Local agencies must update Urban Water Management Plans (UWMP) every five years or when there are significant changes in available supplies or demands. An UWMP is a planning tool that generally guides the actions of water management agencies, providing managers and the public with a broad perspective on a number of water supply issues. A UWMP is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that the Plan include a Section that “describes the opportunities for exchanges or water transfers on a short-term or long-term basis.” (California Urban Water Management Planning Act, Article 2, Section 10630(d)). The identification of such opportunities, and the inclusion of those opportunities in a general water service reliability analysis, neither commits a water management agency to pursue a particular water exchange/transfer opportunity, nor precludes a water management agency from exploring exchange/transfer opportunities not identified in the Plan. When an agency chooses specific projects to implement, the agency develops detailed project plans, prepares an environmental analysis, (if required), and prepares financial and operational plans.

The UWMP is an effort to generally answer a series of planning questions including:

- What are the potential sources of water supply and the reasonable probable yield from each supply?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Based on the UWMP, water suppliers explore enhancing basic supplies from traditional sources such as the State Water Project (SWP) as well as other options. These include groundwater extraction, water exchanges and transfers, water conservation, recycling, brackish water desalination and water banking/conjunctive use. Specific planning efforts will be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, how each option would impact the environment and how each option would affect customers.

The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of customers are met.

The Urban Water Management Plan Act requires coordination with local land use entities. At least 60 days prior to the public hearing on the plan any applicable city or county where the water agency supplies water must be notified that the agency is updating the plan. The water supplier must also provide notice when the Draft UWMP is available for review and comment. Upon completion of the UWMP a copy of the plan must be provided to the applicable land use jurisdictions.

In Solano County, Benicia, Dixon, Fairfield, Rio Vista, Suisun-Solano Water Authority, Vacaville, and Vallejo currently prepare UWMPs for their service areas.

1.1.4.2 Sustainable Groundwater Management Act (State)

In September 2014, the California Legislature enacted comprehensive legislation to manage California groundwater. Known as the Sustainable Groundwater Management Act (SGMA) of 2014, the legislation provides a framework for sustainable management of groundwater supplies by local authorities, with the potential for state intervention if necessary. The first step in the process is the formation of local groundwater sustainability agencies (GSAs). Local agencies must form GSAs to achieve groundwater sustainability in alluvial groundwater basins determined by the state to be high or medium priority, unless adjudicated.

GSAs are empowered to utilize a number of new management tools to achieve the sustainability goal. For example, GSAs may require registration of groundwater wells, mandate annual extraction reports from individual wells, impose limits on extractions, and assess fees to support creation and adoption of a groundwater sustainability plan (GSP). GSAs also may request a revision of a groundwater basin boundary.

SGMA requires GSAs to sustainably manage groundwater basins during the planning and implementation horizon without causing undesirable results. ”Undesirable results” are any of the following effects: chronic lowering of groundwater levels; significant and unreasonable reductions in groundwater storage; significant and unreasonable seawater intrusion; significant and unreasonable degradation of water quality; significant and unreasonable land subsidence; and surface water depletions that have significant and unreasonable adverse impacts on beneficial uses.

SGMA amends planning and zoning laws to require increased coordination among land use planning agencies and GSAs regarding groundwater plans and any updates or modifications of General Plans. Existing local government land use and groundwater rights and authorities are not modified in the Act. Additional information regarding SGMA legislation and changes to state codes can be found in Appendix B.

In Solano County, the Solano Subbasin GSA, City of Vacaville GSA, Sacramento County GSA, Solano Irrigation District GSA, and RD 501, represented by the Northern Delta GSA were the original entities that formed the Solano Subbasin GSA Collaborative (Solano Collaborative) to sustainably manage the groundwater resources in the Solano Subbasin, located in the eastside of Solano County.

The State Department of Water Resources (DWR) required GSAs to adopt GSPs for critically overdrafted basins by 31 January 2020 and by 31 January 2022 for high- and medium-priority basins and to achieve sustainability within 20 years of GSP adoption. The Solano Subbasin is designated a medium priority subbasin by DWR. The Solano Collaborative submitted a GSP in 2022 that was accepted by DWR in 2024. A small portion of the Yolo Subbasin extends into Solano County along the eastern portion of the County. A map of groundwater basins in Solano County and surrounding regions is shown on Figure 1-6.

There are four alluvial groundwater basins/subbasins in Solano County. Only the Solano Subbasin and Yolo Subbasin are designated medium and high priority, respectively and therefore subject to SGMA requirements. The two other groundwater basins include the Suisun-Fairfield Valley Basin and the Napa-Sonoma Lowlands Subbasin, both designated very low priority by the State and are not currently subject to SGMA requirements.

The Suisun-Fairfield Valley Basin is located in the western portion of Solano County and includes areas of Cities of Fairfield and Suisun City, Suisun and Green Valleys, and Suisun Marsh. The Napa-Sonoma Lowlands Subbasin includes portion of Vallejo and Mare Island and extends north into Napa County. Additional information on groundwater basins is described in Sections 1.2.3 through 1.2.6.

1.1.4.3 Solano County Ordinances

The County of Solano plays a role in governance of water management. Through the Subdivision and Zoning Ordinances and Building Code, Solano County sets development conditions to ensure adequate water supply, availability of wastewater disposal, protection of groundwater and surface water quality, and management of stormwater to prevent flooding. However, the County of Solano does not provide urban water service. The County General Plan states “County government is not structured to provide the level of services and facilities needed to serve more intensive urban development”. A summary of applicable goals, policies, and implementation programs in the General Plan that relate to provision of water service, wastewater service, drainage and flood control is provided in Appendix C.

1.1.4.3.1 Subdivision Ordinance

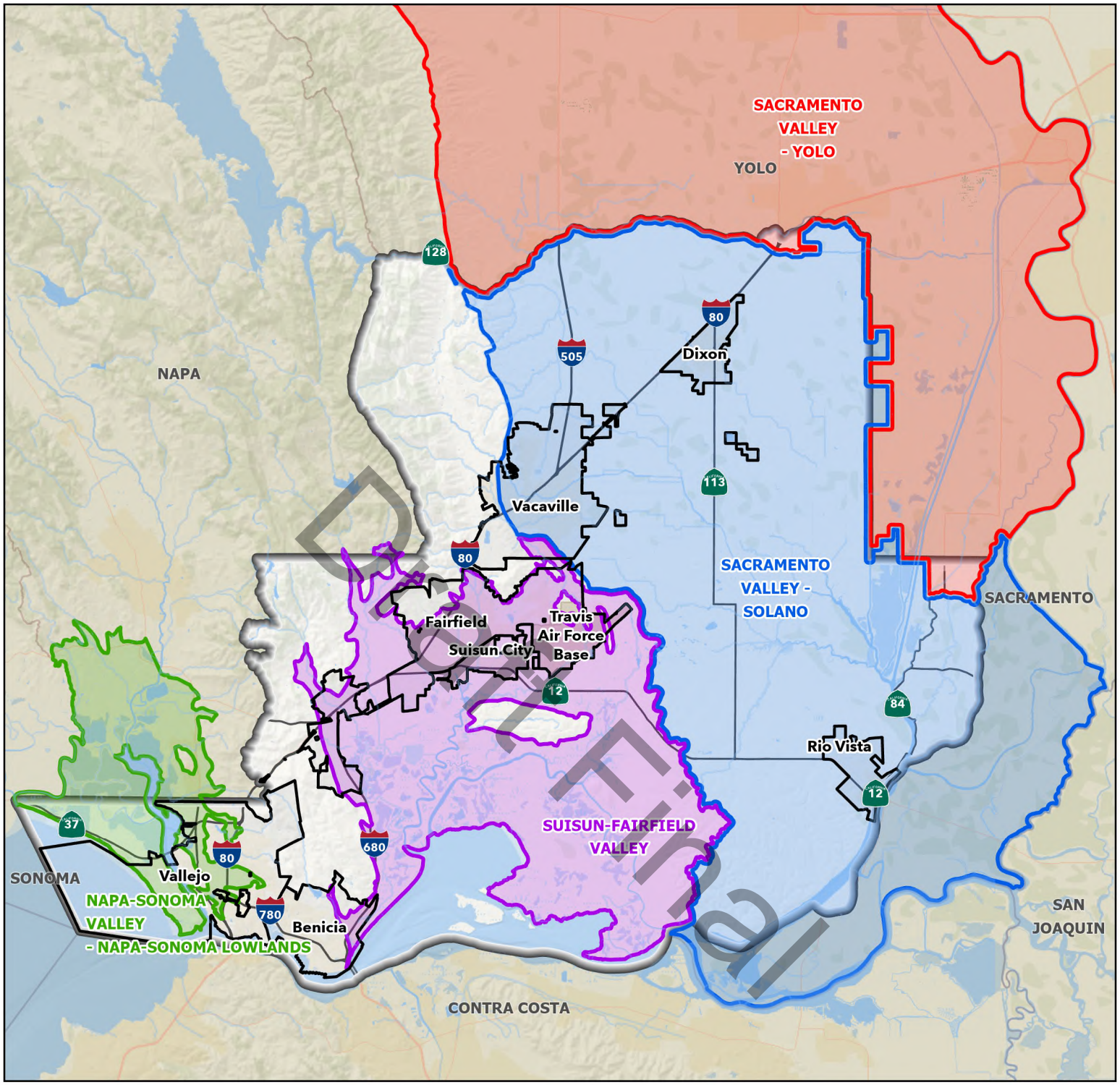
The intent of the Solano County Subdivision Ordinance is to regulate and control subdivisions of land and, in conjunction, implement the County's General Plan. The Subdivision Ordinance applies to “all divisions, reversions to acreage, lot line adjustments, and mergers respecting real property located wholly or partially within the unincorporated areas of Solano County” and “governs the filing, processing, approval, conditional approval, or disapproval of tentative, final and parcel maps, map waivers, and any modifications thereto.” The Subdivision Ordinance includes the following provisions meant to ensure adequate provision of water, to protect water supply, and to protect surface and groundwater quality.

- Whenever a proposed subdivision is located within the boundaries of a public water agency willing and able to provide water service to the lots, the public water agency shall be chosen as the water purveyor for the proposed subdivision. At the time of tentative map approval, these requirements may be waived for cause shown.

- When the proposed subdivision contains lots that are not served by a public water agency, each lot shall have a water supply provided by a private, individual well or spring and the subdivider shall submit to the Environmental Health Services Division the water source quantity information.

- Whenever a proposed subdivision is located within the boundaries of a public sewer agency willing and able to provide sewer services to the lots, the public sewer agency shall be chosen to provide sewer service to the proposed subdivision. This requirement may be waived for good cause.

- In all cases where sewage disposal is not to be serviced by a sewer operated by public sewer agency, Solano County requires it shall be through an individual sewage disposal system located entirely on the lot generating the sewage. Each proposed lot within a subdivision that is not served by a public sewer system shall meet minimum site and design criteria in Solano County Code. Parcels which are served by on-site sewage disposal systems and individual, on-site water supplies shall not be less than 5 acres. Parcels, which are served by on-site sewage disposal systems and community water supplies, operated by a public agency or utility district shall be no less than 2.5 acres. Where a planned unit development process is proposed where parcels may vary in size, the overall density of the project shall not be greater than one dwelling unit per 2.5 acres with a community water supply and no individual parcel development parcel shall be less than one acre in area.



Groundwater Basins

Subbasin Name

- SACRAMENTO VALLEY - SOLANO Subbasin
- NAPA-SONOMA VALLEY - NAPA-SONOMA LOWLANDS
- SACRAMENTO VALLEY - YOLO Subbasin
- SUISUN-FAIRFIELD VALLEY Basin

- Travis Air Force Base
- City Boundary
- County Boundary

Figure 1-6

Source: California Department of Water Resources. Contact: gis@water.ca.gov
https://gis.water.ca.gov/arcgis/rest/services/Geoscientific/i08_B118_CA_GroundwaterBasins/FeatureServer/0

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- The design of a subdivision shall provide proper drainage for the subdivision and all lots and improvements therein based on the ultimate development of the watershed. The subdivision and all lots and improvements shall be protected from off-site drainage or flood damage. All public facilities such as sewer, gas, electrical and water systems shall be located, elevated and constructed to minimize or eliminate potential flood damage. If channels need to be constructed or improved to facilitate surface water removal, reasonable dedications to the appropriate public agency may be required.

- **Infrastructure Funding and Service Coordination**
  Consistent with the Solano County General Plan, all water, wastewater, and drainage infrastructure required to serve a subdivision shall be financed, designed, and constructed by the developer or subdivider. The County does not fund or construct such improvements. Prior to map approval, the County shall coordinate with applicable public water or sewer agencies to confirm service availability and obtain written verification or will-serve agreements. Where a public agency or utility district provides service, a formal service or connection agreement between the developer, the County, and the purveyor agency shall be executed. These agreements ensure that required infrastructure improvements are constructed to agency and County standards, that costs are borne by the developer, and that long-term operation and maintenance responsibilities are clearly assigned.

1.1.4.3.2 Oversight of Small Water Systems

The Solano County Department of Resource Management, Division of Environmental Health (Division) administers and enforces federal, state, and local laws and policies relating to consumer-oriented facilities, water systems and waste disposal, as well as activities involving hazardous materials. As part of their Technical Services Program, the Division regulates state small water systems that serve 5 to 14 service connections at least 60 days per year and which do not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year as detailed in Section 1.2.8.7. Additionally, the Environmental Health Division Consumer Program regulates water systems associated with facilities that provide food to the public but do no meet the thresholds of a state small water system or state-regulated public water system[4].

1.1.4.3.3 Well Permitting

Solano County requires a permit to construct, repair or destroy a water, monitoring or cathodic protection well or soil boring. The purpose of the permitting program is to regulate the manner in which wells are constructed or destroyed to protect the groundwater of the county. For wells permitted in the Solano Subbasin, the Division is also required to coordinate with the GSAs.

1.1.5 City County Coordinating Council

The Solano City County Coordinating Council (CCCC) was established on 18 June 1991 to work together to explore ways to improve communications, coordination, and problem resolution between cities and the County. The CCCC is made up of the mayors of all the County's cities

[4] California Health and Safety code sections 113869 and 114189.

and the Solano County Board of Supervisors. The CCCC also explores issues of regional importance and seeks ways to respond effectively to the actions of other levels of government, including to sponsor or support legislation at the State and Federal level that is of regional importance.

1.2 Water Supplies

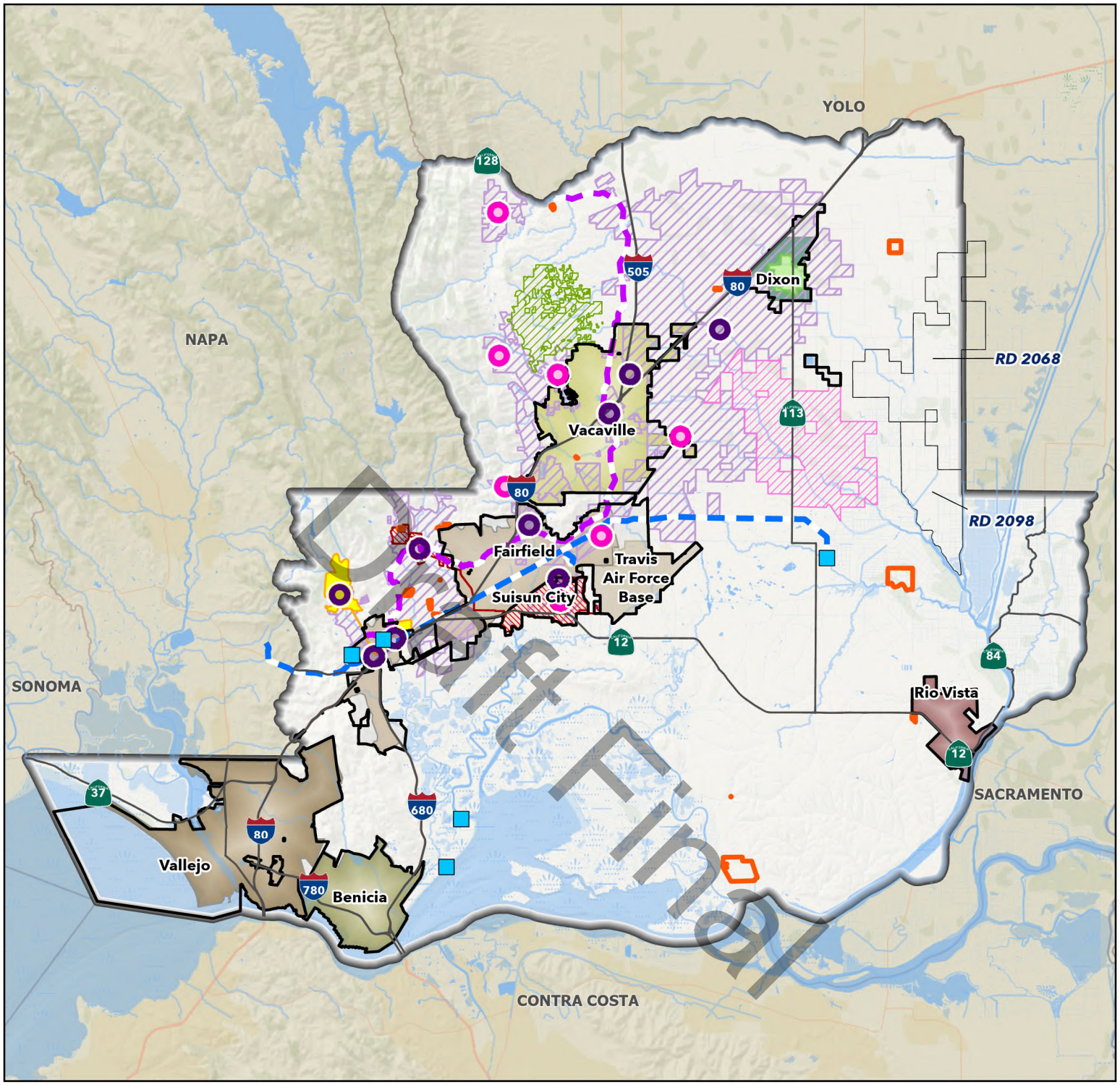
Water supply sources in the County consist of various surface water sources, groundwater, and a minor amount of treated recycled water. The entities that provide water vary from large wholesale suppliers, city water departments, to small domestic and agricultural well operators. The major water projects and water agencies are shown on Figure 1-7. Surface water for Solano County comes from the federal Solano Project, the State Water Project through the North Bay Aqueduct, and other local supplies. Groundwater sources come from the Solano Subbasin, Suisun-Fairfield Valley Basin, and Napa Sonoma Lowlands Subbasin. Some properties rely on groundwater, sometimes in fractured rock formations, from areas outside of an identified groundwater alluvial basin.

1.2.1 Solano Project

The Solano Project is owned by the federal United States Bureau of Reclamation and was developed to meet water demands of agriculture, cities, and military facilities within the County.

In early years, agriculture had primarily used groundwater, but as the agricultural industry grew in the County, groundwater overdraft and lowered groundwater levels became a chronic problem. The Solano Project was authorized by the U.S. Congress in 1948 and started delivering water in 1959. The Solano Project moves surface water, captured and stored in Lake Berryessa and Monticello Dam as well as Lake Solano/Putah Diversion Dam through the Putah South Canal to various uses in the County. Most of the water for the Solano Project comes from winter runoff from the coastal ranges and there is little to no water captured in the summer months (USBR 2023). SCWA manages the Solano Project and is responsible for its operations and maintenance, but it has agreements with others, including SID to maintain specific facilities (County of Solano 2008a). The firm yield of the Solano Project[5], is estimated to be 207,350 AFY with storage in Lake Berryessa of 1.6 million Acre Feet (AF). During planning of the Solano Project, Napa County and Yolo County chose not to participate and hence the project was sized and intended to only deliver water to Solano County, though a small portion of the project water serves the University of California Davis in Yolo County (County of Solano 2008a). Table 1-5 shows the annual entitlements from the Solano Project, which is also the firm yield of Lake Berryessa.

[5] With regard to reservoirs, firm yield is the maximum quantity of water which can be guaranteed during a critical dry period.



Water Agencies and Projects

- Travis Air Force Base
- City Boundary
- County Boundary
- North Bay Aquaduct
- Putah South Canal
- State Water Project Facility
- State Small Water Systems
- Suisun Solano Water Authority
- Rural North Vacaville Water District
- Maine Prairie Water District
- Reclamation Districts
- Solano Irrigation District (SID) Service Area
- SID Public Water Systems
- SID Domestic Water Systems

City Water Department

- City Of Benicia
- City of Dixon
- City of Vacaville
- City of Vallejo
- City of Rio Vista
- City of Fairfield
- California Water Service Area
- Lakes Water System

Figure 1-7

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Table 1-5: Solano Project Contracts

Entity	Annual Entitlement (Acre-Feet)
City of Fairfield	9,200
City of Suisun City	1,600
City of Vacaville	5,750
City of Vallejo	14,600
Solano Irrigation District	141,000
Maine Prairie Water District	15,000
University of California at Davis	4,000
California State Prison, Solano	1,200
Operating Loss (estimated)	15,000
Total Project	**207,350**

County of Solano 2008b

1.2.2 State Water Project, North Bay Aqueduct

The SWP is a multi-purpose water system operated and maintained by the California DWR. Two out of every three Californians receives water from the SWP, mostly in central and southern California. The North Bay Aqueduct is a specific facility of the SWP that serves surface water to Napa and Solano counties. SCWA is the contract holder for SWP water for municipal use and has a Table A[6] amount of 47,756 AFY; SCWA participating agencies have maximum Table A amounts as shown in Table 1-6. The SWP system is not 100 percent reliable; the long-term average delivery of the SWP is expected to be only 56% of Table A amounts and dry year deliveries as low as 5% (Department of Water Resources 2021).

Table 1-6: SWP Maximum Annual Table A Amounts

Entity	Maximum Table A Amount (Acre-Feet)
City of Benicia	17,200
City of Fairfield	14,678
City of Suisun City	1,300
City of Vacaville	8,978
City of Vallejo	5,600
Total Project	**47,756**

Note: City of Vallejo and City of Rio Vista have a right to obtain a specified portion (1,500 Acre-feet per year each) of SCWA Table A supply. They currently do not have the means to deliver the water in their services, but may call upon their water with a 5-year notice.
Source: Kennedy Jenks, 2021

Vallejo Permit Water (VPW), which is non–State Water Project Water, is derived from a water rights license held by the City of Vallejo. The license allows pumping of 31.52 cubic feet per second (cfs) from the Sacramento River Delta by the City of Vallejo for use in its service area

[6] Table A is a term that refers to the maximum amount of water each SWP contractor can receive, not inclusive of special case “interruptible” deliveries. The amount of water received by a contractor varies year to year based on hydrologic conditions, current reservoir storage, and requests by other SWP contractors. Water delivered by the SWP in a given year is often expressed as a percentage of Table A.

including the cities of Vallejo and Benicia, portions of the city of Fairfield, and the American Canyon area of Napa County.

In 1990, the cities of Benicia, Fairfield, and Vacaville filed for State Water Resource Control Board (SWRCB) water rights permits for an appropriation of water under the State's watershed of origin statutes. The permit application was withdrawn after a settlement was reached with DWR that provided an essentially equivalent water supply from the SWP. A settlement agreement and a conveyance agreement with DWR specify the details of the Settlement Agreement water supply of the area-of-origin water rights. The Settlement Agreement water is available up to the following amounts:

- Benicia – 10,500 AF per year
- Fairfield – 11,800 AF per year
- Vacaville – 9,320 AF per year

Additionally, there are other local surface water supplies derived from various watersheds in the County. The City of Vallejo has local surface water supplies stored in the "Vallejo Lakes Water System," which includes Lakes Frey, Madigan, and Curry. The Vallejo Lakes Water System historically provided water to the City of Vallejo, but it currently provides water to the unincorporated communities in Suisun Valley and Green Valley. The City of Vallejo agreed to serve some residents in these valley areas as part of the development of the Vallejo Lakes Water System. The largest lake, Lake Curry, has a storage capacity of 10,700 acre-feet and a yield of about 3,750 acre-feet per year but is not part of the Vallejo Lakes Water System. The City of Benicia uses Lake Herman, located in the hills between Benicia and Vallejo. Lake Herman has a storage capacity of 1,800 acre-feet. The average yield in normal to wet years of the 10-square-mile watershed is 500 to 1,000 acre-feet annually and no yield in dry years.

In the eastern Delta part of Solano County, growers who hold riparian or appropriative rights would divert directly from local waterways in the Delta. The State Water Resources Control Board regulates permitted water rights and tracks the amount of this water use through the Electronic Water Rights Information Management System (eWRIMS). These supplies are very reliable because water is always available in this part of the Delta, however, water quality may depend on the location of individual water intakes.

1.2.3 Groundwater, Sacramento Valley - Solano Subbasin

This subbasin is located in California's Sacramento River hydrologic region and generally the eastern portion of Solano County (Eastside). The Basin is approximately 354,673 acres in size and generally stretches from the foothills above Vacaville easterly to the Sacramento River and from Putah Creek to the north to the boundaries of Fairfield to the south Solano Subbasin (Groundwater Sustainability Agency 2021). DWR designated the Solano Subbasin as a medium priority subject to SGMA as described in Section 1.1.4.2. See also Figure 1-6.

As described earlier, this subbasin is subject to management under SGMA and is managed by the Solano Subbasin GSA Collaborative. The Solano Subbasin GSP and annual reporting done by the Solano GSA Collaborative show groundwater levels with stable long-term trends,

although groundwater levels remain depressed in a localized area in the northwestern portion of the Solano Subbasin (Northwest Focus Area). Groundwater quality in the subbasin is generally suitable for all beneficial uses, including drinking water. However, as discussed further in Chapter 2, participants identified potential risk of contamination from poor well construction, poor septic system maintenance, and naturally occurring arsenic. The Delta areas of the subbasin have experienced subsidence due to oxidation of peat deposits, but data indicates only very minor amounts of subsidence in the subbasin related to groundwater pumping (Solano Subbasin Groundwater Sustainability Agency 2021 and 2023).

1.2.4 Groundwater, Sacramento Valley - Yolo Subbasin.

This subbasin is located in California's Sacramento River hydrologic region and only a very small portion overlaps with Solano County (DWR 2014). See also Figure 1-6. DWR designated the Yolo Subbasin as high priority and is subject to management under SGMA. The subbasin is managed by the Yolo Subbasin Groundwater Management Agency.

1.2.5 Groundwater, San Francisco Bay - Suisun-Fairfield Valley Basin

This basin is located in California's San Francisco Bay hydrologic region and is entirely located within Solano County (DWR 2003). Though both the cities of Suisun City and Fairfield overlie this basin, as does the Suisun-Solano Water Authority, none of these agencies uses the groundwater for potable water or irrigation purposes. The southern portion of the basin is subject to tidal inflows that make the groundwater brackish and unsuitable without expensive treatment (City of Suisun City 2023, City of Fairfield 2021, Suisun-Solano Water Authority 2023). There is some limited use of groundwater from the basin by domestic and ag wells; however, there is limited information regarding the quantity and quality of the groundwater in the basin. DWR designated the Suisun-Fairfield Valley Basin as very low priority for the purposes of SGMA which allows local agencies to voluntarily manage the groundwater resources or prepare a GSP. Elevated concentrations of boron, Total Dissolved solids (TDS), and volatile organic compound have been reported within localized areas in the groundwater in the Suisun-Fairfield Valley Groundwater Basin, specifically near Travis Air Force Base (USGS 1960, 2008). The southern portion of the basin is also subject to shallow groundwater and water quality impacts associated with sea level rise and climatic impacts.

1.2.6 Groundwater, San Francisco Bay - Napa-Sonoma Valley - Napa-Sonoma Lowlands Subbasin.

The southern half of this subbasin lies within Solano County. The subbasin underlies the lowland area immediately north of San Pablo Bay and extends from Napa County into the City of Vallejo in Solano County (DWR 2014). Groundwater from the Napa-Sonoma Lowlands subbasin within Solano County is generally not used by municipal sources due to poor water quality (brackish) in the southern portions of the subbasin. There is some limited use of groundwater from the subbasin by domestic and agricultural wells in Napa County. Groundwater in this subbasin tends to be very shallow (less than 20-foot depth to water) (DWR 2014). DWR designated the Napa-Sonoma Lowlands Subbasin as low priority for the purposes of SGMA which allows local agencies to voluntarily prepare a GSP.

1.2.7 Recycled Water

Historically, Fairfield-Suisun Sewer District (FSSD) has delivered recycled water to properties near their wastewater treatment plant for use on nursery crops and sod production; but this use is minor. The City of Vacaville is evaluating the feasibility of using tertiary effluent from their wastewater treatment plant for irrigation. As proposed at the time of this study, Vacaville anticipates putting 2,830 AFY recycled water to beneficial reuse starting in year 2030 (Vacaville 2021). Additional information about recycled water potential is found in Section 1.3.2.

1.2.8 Water Purveyors

While the County of Solano provides many public services including police and fire protection, libraries, and road and drainage improvements, the County General Plan explicitly states that:

> "County government is not structured to provide the level of services and facilities needed to serve more intensive urban development typical in cities. Many services provided in the unincorporated county are provided by independent special districts, such as fire protection and water service in some areas, or by private companies such as garbage service" (County of Solano 2008a).

Water for domestic and irrigation uses is supplied by multiple layers of water purveyors within Solano County as shown on Figure 1-7. The water purveyors are typically classified by their organizational structure (public or private entity), services provided (e.g., water, water and sanitation, general public works), the customers they serve (municipal or agricultural uses), and the type of water served (e.g. potable or non-potable water).

1.2.8.1 Wholesale Water Agency

Solano County Water Agency (SCWA) is a wholesale water agency in Solano County. SCWA provides untreated water to city water departments and agricultural districts in Solano County from both the Solano Project and the SWP. Additionally, SCWA leads efforts to protect rights to existing sources of water and participates in efforts to secure new sources of water for water supply reliability and future growth in the County.

SCWA is also responsible for operation and maintenance of various flood control projects including Ulatis Flood Control Project, Green Valley Flood Control Project, and other flood control matters within SCWA boundaries.

SCWA and other agencies within the Solano Subbasin monitor and report water levels as part of the groundwater monitoring network established by the Solano Subbasin GSP required by the SGMA. A total of about 170 wells throughout Solano County are currently monitored through the California Statewide Groundwater Elevation Monitoring (CASGEM) program of which 117 wells are under of the Solano Subbasin GSP monitoring network.

The Solano Water Authority (SWA) was formed through a Joint Exercise of Powers Agreement (JEPA) between the cities, water districts and Solano County. SWA is made up of the same member agencies that make up the SCWA Board of Directors. SWA is authorized to enter into separate agreements among its member agencies to execute projects that may not need to

involve all member of the SCWA Board of Directors. In this way, the SWA facilitates beneficial water projects and keeps all members informed of the water activities of other agencies.

1.2.8.2 Special Districts

Special districts are typically special purpose local government agencies governed by a Board of Directors. An important special district in Solano County is SID. The SID service area covers approximately 73,000 acres. SID primarily serves agriculture but also has municipal and industrial users in 18 locations. It provides irrigation water and potable water to approximately 11,000 retail customers including 10,000 potable water customers, and 1,000 non-potable water customers. SID also supplies wholesale raw water for a residential population of more than 300,000, including the cities of Benicia, Vacaville, Fairfield and Vallejo and several small communities. SID operates the Solano Project, which is its primary surface water supply. Besides its surface water supply, SID also owns 35 deep water wells of which 28 are currently in production and 7 are for monitoring. In addition to the Solano Project water and local groundwater supplies, SID reuses tailwater and canal spillage from the drains. SID has no responsibility for managing storm water but has facilities for agricultural irrigation that incidentally convey storm water during the non-irrigation season. Within the Solano Project water delivery system, SID generates hydroelectricity in the Monticello Power Plant at the base of the Monticello Dam.

Maine Prairie Water District (MPWD) is a special district to provide irrigation water to about 15,000 acres of agricultural lands in unincorporated Solano County, east of the Vaca Mountains and south of Interstate 80. The sources of MPWD's water supply are from the Solano Project, the Solano Irrigation District, and local surface water rights. MPWD has a contract with SCWA for a maximum delivery of 15,000 AFY of Solano Project water through the Putah South Canal. MPWD receives SID's tail water and return flows through an exchange agreement in which MPWD is allowed to exchange up to 10,000 AF of Solano Project water at a rate of 2 AF of tail water for 1 AF of Solano Project water. It also holds post-1914 appropriate water rights in local streams as well as drainage water from Dixon Resource Conservation District as part of an agreement. MPWD does not supply potable water and extract from groundwater wells.

Additionally, operational spills from MPWD ditches and drainage channels flow back into Ulatis Creek or into drainage channels flowing easterly where they become a source of supply for landowners outside the MPWD or by Reclamation District No. 2068.

Another special district in Solano County is the Rural North Vacaville Water District. Rural North Vacaville Water District is a Community Services District (CSD) that was formed in 1996, to provide potable water for domestic use and fire suppression purposes in an unincorporated part of Solano County north of the City of Vacaville, an area referred to as "English Hills". The service area is approximately 5,163 acres, approximately 1,118 persons, primarily of rural residential and agricultural lands. Rural North Vacaville Water District's sole source of water is groundwater from the Solano Subbasin (Solano County LAFCO 2022). SID operates the Rural North Vacaville Water District systems under contract.

1.2.8.3 City Water Departments

It is within the authority of municipalities to operate water systems. The cities of Benicia, Dixon, Fairfield, Rio Vista, Vacaville, and Vallejo operate water systems that deliver water to areas in

their municipalities and portions of the unincorporated county within their service boundaries. Many cities acquire water from SCWA or/and SID and/or pump local groundwater. The City of Suisun City and SID executed a JEPA in 1988 to form the Suisun-Solano Water Authority, which provides potable water to the City of Suisun City and parts of Suisun Valley. The City of Vallejo owns and operates the Lakes Water System serving potable water in Suisun, Green, Gordon Valleys, and American Canyon (which can also be served by the City of Vallejo's main system) the City of Vallejo executed a JEPA in 2020 with Solano County for providing potable water service within areas currently served and which could be served by the Lakes Water System.

1.2.8.4 Investor-Owned Utilities

Investor-owned public utilities can also supply water within California. Oversight of the water rate setting process and district operations is provided by the California Public Utilities Commission (CPUC). An investor-owned public utility providing water in Solano County is California Water Service (Cal Water) Dixon District. Cal Water Dixon provides water to a portion of the City of Dixon. It also operates and maintains the distribution and storage facilities for the Travis Air force Base potable water system.

1.2.8.5 Solano Water Advisory Commission

The Solano Water Advisory Commission (SWAC) is made up of the senior managers from SCWA-member agencies in Solano County. Regular members include Maine Prairie Water District, Reclamation District 2068, Solano Irrigation District, and the seven cities in Solano County (City of Benicia, City of Dixon, City of Fairfield, City of Rio Vista, Suisun City, City of Vacaville, and City of Vallejo) and Solano County. The SWAC provides a forum for public communication and consensus-building on water issues affecting the County and is used to communicate local, regional, state, and federal water policies of interest of concern to Solano County. The SWAC also serves as a vehicle for implementation of SCWA (as the area's wholesaler of urban water supply) policies delegated by the Board and evaluates collaborative projects that any member may wish to undertake.

1.2.8.6 Reclamation Districts

As described further in Section 1.4.6 there are 25 Reclamation Districts within Solano County. The majority of these districts were formed for the primary purpose of operating and maintaining flood control and tidal levees and drainage system. However, Reclamation District 2068 does provide irrigation water to approximately 15,261 acres of agricultural land within its service area besides maintaining drainage and levees for flood protection. The district holds 3 appropriate rights and 21 riparian and pre-1914 water rights from the Sacramento River for irrigation. It currently does not use any groundwater for its supply.

Several reclamation districts in the Suisun Marsh area provide water delivery for the maintenance of habitat (Solano LAFCO 2020).

1.2.8.7 Domestic and Agricultural Wells

Domestic service for rural homes and irrigation for crop production is commonly provided by individual shallow domestic or deep irrigation wells, respectively. As noted earlier, some

domestic wells are found in fractured rock not in a recognized alluvial groundwater basin while agricultural irrigation wells are typically in one of the groundwater basins.

1.2.8.8 Regulation of Water Purveyors

In addition to a water purveyor's organizational structure, how a water system is regulated depends on the number of connections and consistency of the service (e.g., year-round, less than six months a year.) At the most basic level is a Public Water System, a water system that serves 15 or more connections or serves at least 25 individuals daily for at least sixty days a year. Table 1-7 provides a breakdown of the various types of water systems and how they are regulated.

Table 1-7: Water System Regulation

Type of Water System	# of Connections	Regulated by
Public Water Systems		
Community Water System	At least 15 service connections or year-long residents or that regularly serves at least 25 year-long residents	State Water Resources Control Board, Division of Drinking Water
Non community water system	A public water system that is not a community water system.	
Non transient non community water system	Regularly serves 25 or more of the same persons over six months per year.	
Transient non community water system	Does not regularly service 25 or more of the same persons over the same six months per year.	
Other Types of Water Systems		
State Small Water Systems	Not a public water system, serves 5-14 service connections at least 60 days per year or facilities with water systems that serve food to the public but are not regulated by the State.	Solano County Environmental Health Department
Other	Systems serving less than 5 connections and do not serve food to the public.	System not regulated by the State nor Solano County. Solano County does regulate well construction for all wells.
Private	Well or diversion for private residence or for irrigation	Solano County regulates well construction for all wells.

1.2.8.9 Water Demands

A summary of water demands in the County as delivered by various purveyors has been compiled from a variety of sources for the developed areas of the County.

Table 1-8: Estimated Water Demand (acre-feet per year)

Service Area	2020	2025	2030	2035	2040
City of Benicia (1)	9,383	10,035	10,085	10,202	10,310
City of Fairfield (1)	6,808	7,106	7,657	7,776	8,088
City of Vallejo (1)	13,787	22,108	23,150	24,328	25,885
City of Dixon (1)	2,155	4,475	4,972	5,470	5,969
Cal Water Service - Dixon (1)	1,391	1,335	1,295	1,302	1,307
City of Rio Vista (1)	2,025	2,388	2,627	2,890	3,179
City of Vacaville (1)	18,295	18,620	18,974	20,141	20,985
Solano Irrigation District - Vallejo Area (2)					
Green Valley (Untreated)	460	460	460	460	460
Solano Irrigation District - Fairfield Area (2)					
Paradise Valley (Untreated)	483	483	483	483	483
Fairfield Corporate Commons (Untreated)	97	97	97	97	97
North Cordelia (Untreated)	391	391	391	391	391
Peabody (Potable)	6	6	6	6	6
Peabody (Untreated)	1	1	1	1	1
Solano Irrigation District - Suisun City Area (2)					
Tolenas (Potable)	81	81	81	81	81
Solano Irrigation District -Vacaville Area (2)					
Pleasant Hills Ranch Estates (Potable)	15	38	38	38	38
Pleasant Valley Non-Potable (Untreated)	82	82	82	82	82
Gibson Ranch Public (Potable)	20	20	20	20	20
Gibson Ranch Non-Public (Untreated)	6	6	6	6	6
North Village (Irrigation Water)	242	242	242	242	242
Nut Tree (Irrigation Water)	66	66	66	66	66
Allison/Ulatis (Irrigation Water)	156	156	156	156	156
Blue Ridge Oaks (Potable)	4	4	4	4	4
Blue Ridge Oaks (Untreated)	62	62	62	62	62
Suisun Solano Water Authority	1,173	1,115	1,093	1,091	1,082
Travis AFB (3)	2,178	3,068	3,068	3,068	3,068
State Small Water Systems - Total of 9 permitted by County			unknown		
Sum Known Developed Area Potable Use (AFY)	57,321	70,399	73,070	76,417	80,023
Sum Known Developed Area Non-Potable Use (AFY) includes irrigation water and untreated	2,046	2,046	2,046	2,046	2,046

Notes:
1. Data from 2020 Urban Water Management Plan
2. Based on estimates provided in SID Financial Plan, Water Rate Study and Capital Replacement Charge Study 2021-2025
3. Based on water sold by City of Vallejo to Travis AFB, City of Vallejo 2020 UWMP. Travis AFB also has wells, but appears groundwater only used when Water Treatment Plant down for maintenance.

1.3 Wastewater

As described earlier, based on County policy, most higher density urban development is located within city boundaries. Therefore, the County of Solano typically does not provide urban services, such as wastewater treatment, in the unincorporated area. Centralized wastewater is primarily regulated by the state through the applicable regional board, the San Francisco RWQCB on the Westside and the Central Valley RWQCB on the Eastside. Onsite Wastewater Treatment Systems (OWTS) policy for septic systems is set by the SWRCB for implementation by counties. The authority for managing wastewater comes from the Clean Water Act (federal) and the Porter-Cologne Water Act (state).

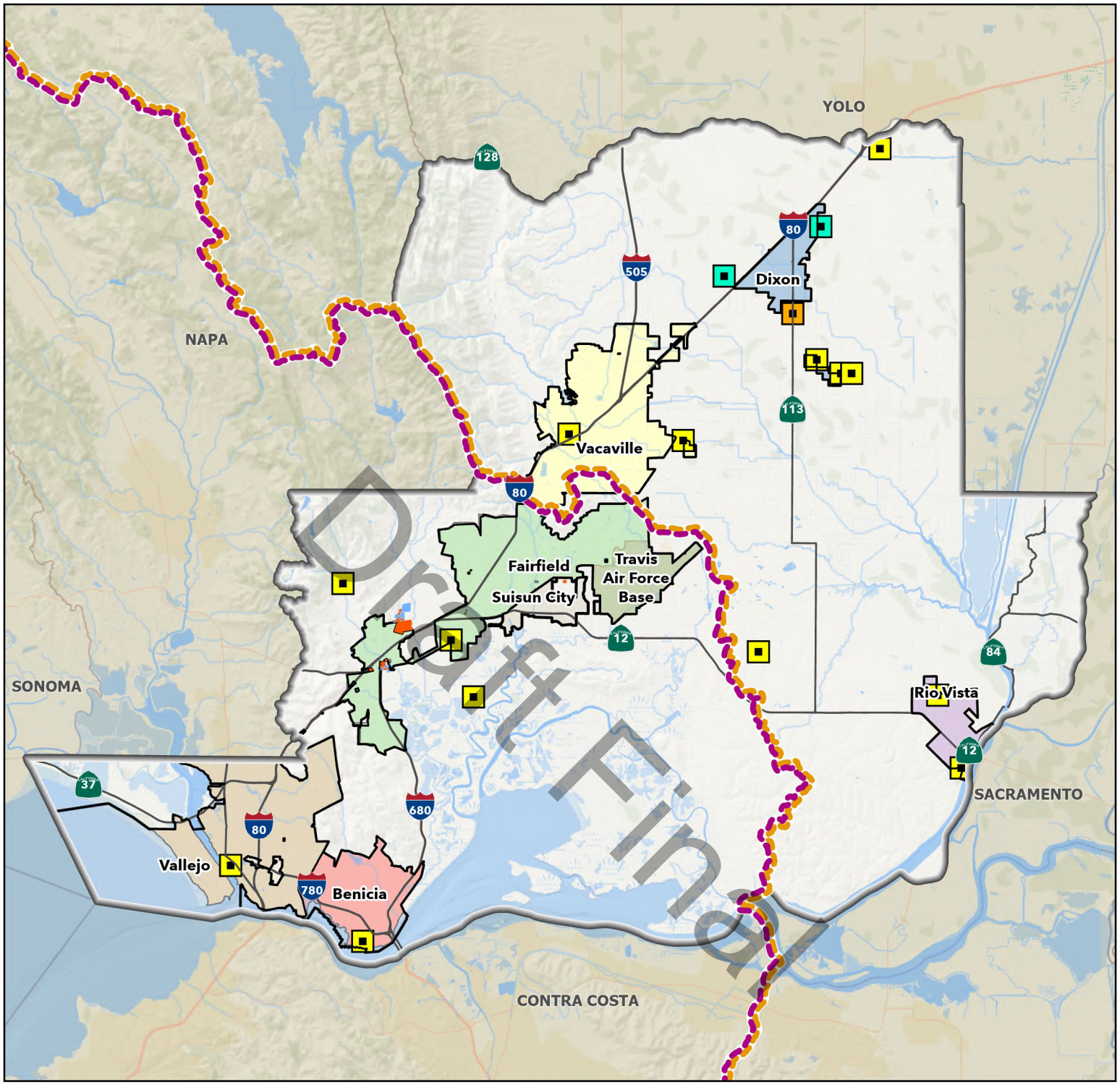
There are five centralized wastewater treatment facilities in the Westside regulated by the San Francisco RWQCB. There are 16 other regulated entities in the Westside area, 14 are for industrial stormwater (held by industrial food preparers, industrial malt beverages, and wineries) and two are waivers (for those discharging less than one million gallons/year to land). Some land application of wastewater includes crop watering. Regulated wastewater facilities are mapped on Figure 1-8. The SWRCB adopted a General Order for Wineries on January,20, 2021. This order requires that existing wineries that discharge more than 10,000 gallons per year or more of process water to land apply for coverage under the new General Order starting in January 2024.

There are 13 Waste Discharge Requirements (WDR) permittees in the Eastside of the County regulated by the Central Valley RWQCB, 10 are municipal wastewater treatment facilities, one is a slaughterhouse and two are food processors. The Central Valley RWQCB also issues waivers to WDRs for facilities that produce less than one million gallons of wastewater for land discharge annually. Waivers have been obtained by cannabis sites, food processors, food preparation, and malt beverage producers. Wastewater systems for residential uses in the unincorporated areas is typically through individual septic systems. A typical residential septic system uses a tank and then gravity or pump to disperse effluent through a disposal field, without any pretreatment. In the unincorporated area, Solano County Environmental Health regulates installation, modification, repair and abandonment of septic systems for residential and other uses for properties that cannot connect to a centralized wastewater system.

1.3.1 Wastewater Service Providers

Municipal wastewater treatment facilities are operated by the Vallejo Flood and Wastewater District, the Cities of Benicia, Vacaville, Dixon, Rio Vista, and the Fairfield-Suisun Sewer District.

- **Vallejo Flood and Wastewater District.** Vallejo Flood and Wastewater District (VFWD) provides all wastewater collection, treatment, and disposal services for the City of Vallejo, Mare Island, and the adjacent unincorporated areas of Sandy Beach, Home Acres, and Starr Subdivision, and Hidden Brook. The VFWD system consists of wastewater treatment plant that treats flow averaging from approximately 8 to 10 million gallons per day (MGD). The treatment plant consists of conventional secondary treatment and eventual discharge into the Mare Island Strait (Vallejo Flood and Wastewater District, 2018).



Regulated Wastewater Treatment Facilities and Service Areas

Figure 1-8

- Central Valley Regional Board
- San Francisco Bay Regional Board
- Travis Air Force Base
- City Boundary
- Solano County Boundary

Fairfield Suisun Sewer District (FSSD)

Extended Service Parcels

- CONNECTED
- ELIGIBLE

Consolidated Wastewater System Service Areas

- Benicia
- Dixon
- FSSD
- Rio Vista
- Vacaville
- Vallejo Flood and Wastewater District (VFWD)

Waste Discharge Requirements (WDR) Permit Locations

- Food Processing
- Slaughtering
- Municipal Wastewater Treatment Facility

Disclaimer - The Fairfield Suisun Sewer District (FSSD) data is intended to provide access to public record information. The Fairfield-Suisun Sewer District makes no guarantee nor representation of any kind concerning the accuracy, completeness or suitability of any reports, information and/or data so provided. Any use of such reports, information and/or data is at the recipient's sole risk.

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- **City of Benicia.** The City of Benicia owns and operates facilities providing wastewater collection within the city limits. The wastewater system includes a 4.5 MGD treatment plant, approximately 150 miles of pipeline, 23 pumping stations, and a 1,300-foot-long deep-water outfall to the Carquinez Strait. A Municipal Services Review performed by the Solano Local Agency Formation Commission (LAFCO) concluded that "Capacity of the [wastewater treatment] plant is adequate to handle wastewater generated by both existing and projected uses within the city limits (Solano County LAFCO 2017).

- **City of Vacaville.** The City of Vacaville provides wastewater collection and treatment for most developed areas within the city limit. The city also provides wastewater treatment services properties located outside of the city in the community of Elmira. According to the Solano County LAFCO, "City services were provided to the Elmira properties in the 1960-1990s, which predates current state law pertaining to the extension of services outside city limits" (Solano LAFCO 2017). The Easterly Wastewater Treatment Plant operated by the City of Vacaville is a 15 MGD tertiary treatment facility. Treated effluent from the plant is discharged into Old Alamo Creek north of the plant and ultimately flows into Cache Slough through the Ulatis channel. Some of the treated effluent is re-used as irrigation water for agriculture to the east. The Solano County LAFCO found that the current wastewater treatment infrastructure was sufficient to handle anticipated growth in the community for at least 16 years (or until 2033) but as the City of Vacaville builds out an expansion of the wastewater treatment plan may be necessary (Solano County LAFCO 2017).

- **City of Dixon.** The City of Dixon provides wastewater collection and treatment services to properties located within the City limits. Following treatment, wastewater is disposed of using percolation ponds (Dixon 2022).

- **City of Rio Vista.** The City of Rio Vista collects and treats wastewater within its city limits at two wastewater treatment plants. Following treatment, effluent from these plants is discharged to the Sacramento River (Rio Vista 2021).

- **Fairfield-Suisun Sewer District.** The FSSD provides wastewater collection and treatment within the city limits of Fairfield and Suisun City, including Travis Air Force Base. Through a 2003 agreement between the County and FSSD, FSSD provides sewer service to several properties in the unincorporated areas of Old Cordelia and Suisun Valley Road, due to the presence of pre-existing sewer infrastructure in those areas. FSSD's wastewater treatment plant treats an average of 14 million gallons per day to advanced secondary treatment levels. Most of the wastewater is discharged through a shallow-water outfall to adjacent duck clubs and the Boynton Slough for enhancement by fresh water, while a small portion of the treated wastewater is recycled for on-site utility water and provided for agricultural irrigation adjacent to the wastewater treatment plant. FSSD was created by an act of the State Legislature, which legislatively determined its boundaries to be co-terminus with the city limits of Fairfield and Suisun City, with a few limited exceptions (FSSD 2023).

1.3.2 Recycled Water Providers

Production of recycled water for irrigation or production of advanced treated water for potable use is a means of wastewater disposal. At the current time, limited amounts of recycled water are delivered to irrigation uses in the immediate vicinity of wastewater treatment plants such as

at FSSD. FSSD is exploring a couple minor expansions of its recycled water system in Southern Fairfield and adjacent unincorporated areas, but these expansions require infrastructure installation, regulatory approval, or contractual amendment to effectuate. FSSD intends to conduct a recycled water master plan within the next several years to explore the feasibility, potential users, and cost feasibility of expanding service. The City of Vacaville also uses a limited amount of recycled water internally at its wastewater treatment plant and for irrigation at the treatment plant site. Since 2014, the City of Vacaville has required developments to install recycled water pipelines in areas that could be served with recycled water in the future. There are approximately 20 miles of recycled water pipeline in place that could serve recycled water in the future (Vacaville 2021).

Other cities have considered recycled water, but these evaluations concluded recycled water was not economical given there are other more cost-effective water sources available. Table 1-9 below identifies the potential recycled water production by the municipal wastewater treatment facilities in the County, based on flows reported in the 2020 UWMPs.

Table 1-9: Recycled Water Generation Potential (Treated Discharge)

Wastewater Facility Name	2020 UWMP Wastewater Discharge, AFY	Source
Vallejo Wastewater Treatment Plant (Vallejo Flood and Wastewater District)	9,207 (secondary treated) collected from City of Vallejo	City of Vallejo 2020 UWMP
Benicia Wastewater Treatment Plant	2,083 (tertiary treated)	Table 6-3, 2020 UWMP
Easterly Wastewater Treatment Plant (City of Vacaville)	8,154 (tertiary treated)	Table 6-3, 2020 UWMP
Dixon Wastewater Treatment Facility	1,224 (secondary treated)	Table 6-3, Dixon 2020 UWMP
City of Rio Vista	288 (tertiary treated), 447 (secondary treated)	Table 6-3, Rio Vista UWMP
Fairfield-Suisun Sewer District	14,730 collected from City of Fairfield, City of Suisun, unincorporated County	FSSD, 2025

1.4 Drainage

Drainage systems are meant to prevent stormwater, rainwater, and runoff from human activity from ponding or inundating areas not intended to receive such waters. Drainage facilities can be natural and/or constructed (ditches, swales, canals). There are a number of agencies in the unincorporated areas of Solano County that own and manage facilities that provide drainage including SCWA, SID, MPWD, Reclamation Districts, Dixon RCD, Solano County, and state and federal government entities. Some of these facilities are primarily for irrigation water tailwater conveyance and sized accordingly but may also provide incidental function for stormwater for which it was not originally sized. These facilities are depicted on Figure 1-9.

SCWA was originally the Solano County Flood Control and Water Conservation District. SCWA represents both water and flood management interests for much of Solano County, while the seven cities in Solano County, two RCDs as well as SID, Reclamation District 2068, and Maine-

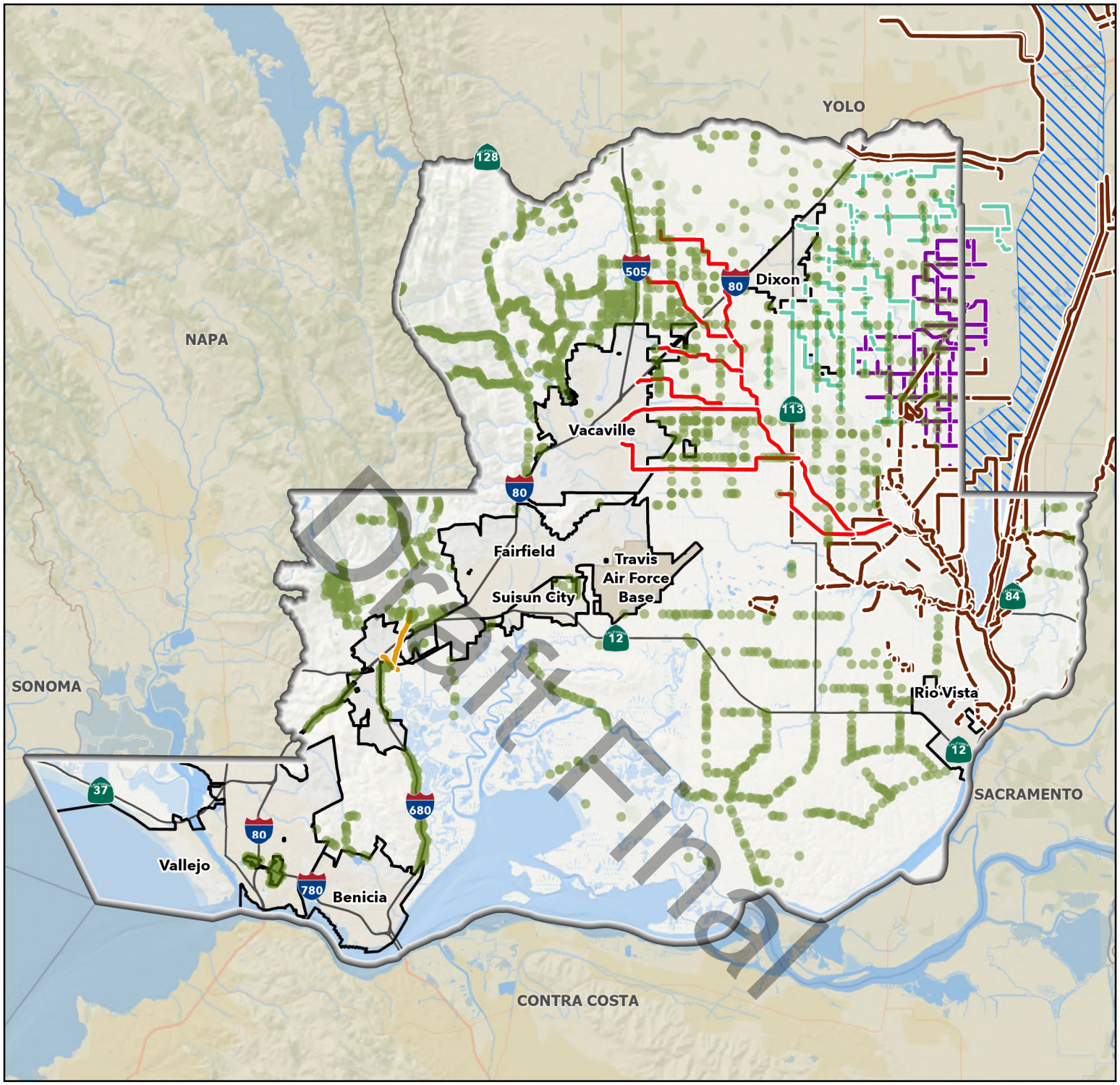
Prairie Water District have jurisdictional responsibilities in their service areas. SCWA is responsible for the operations and maintenance of two large flood control projects (i.e., Green Valley Flood Control Project and Ulatis Project) and supports cities, districts and the County with flood control planning and technical assistance.

Solano County cities are individually responsible for drainage within their borders and have constructed facilities to handle surface runoff. As stated in the Solano County General Plan

> "The unincorporated county relies heavily on gravity to drain excess surface waters to natural water courses.…Landowners within the unincorporated county's watersheds must capture runoff on-site because there is no other system available to accommodate that runoff. These landowners will need to find ways to allow water to filter into the soil on their properties and/or use other natural systems to detain and filter runoff."

It is County policy to "Cooperate with the cities, Solano County Water Agency, and other special districts to serve all areas in need of drainage improvements." (County of Solano 2008a).

However, Solano County is responsible for managing stormwater runoff and drainage on and through county roads, right of ways, and culverts. One of the larger drainage systems on the Westside is the Green Valley Flood Control Project. The Eastside is part of the area covered by the Central Valley Flood Protection Plan (CVFPP), the area of the Yolo Bypass, and the Ulatis Project. Specific flood projects and agency responsibilities are detailed in the sections that follow.



Drainage Facilities

Figure 1-9

- County Road Culverts
- Reclamation District (RD) 2068 Facilities
- Ulatis Flood Control Channels
- Green Valley Flood Control Project
- State or Federal Levees
- Dixon Resource Conservation District Channels
- Yolo Bypass
- Travis Air Force Base
- City Boundary
- Solano County Boundary

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1.4.1 Green Valley Flood Control Project

The Green Valley Flood Control Project is located in the Cordelia area to provide drainage through man-made channels from the watershed between the areas of Vallejo and Fairfield to the Suisun Marsh (Figure 1-9). The US Army Corps of Engineers designed and constructed the project in the early 1960's. The project is operated and maintained by SCWA.

At the time, the project was intended to provide flood control for an undeveloped area. The target was to control the 40-year recurrence level flood. This is a lower level of flood control than is typically provided in urban areas that require 100-year flood protection. Since construction, portions of the Green Valley Project have been upgraded within the City of Fairfield to provide 100-year flood protection. The channels of the Green Valley Project are unlined earthen channels, and some vegetation is allowed in order to protect slope integrity. Trees and woody vegetation are cleared to maintain adequate flood control capacity, and dredging is performed as needed (SCWA 2023).

1.4.2 Central Valley Flood Protection Plan and Yolo Bypass

DWR and Central Valley Flood Protection Board (formerly State Reclamation Board) adopted the CVFPP in 2012 and most recently updated the plan in 2022. The CVFPP covers the entire Delta Region including the eastern portion of Solano County. The foundation of the CVPPP is the State Systemwide Investment Approach which targets 200-year level of protection for urban and urbanizing areas, up to 100-year level of protection for small communities, rural-agricultural levee repairs, weir and bypass expansions, flood structure modifications and improvements, and ecosystem restoration (California Department of Water Resources 2022).

The 59,000-acre Yolo Bypass is a part of the larger Sacramento River Flood Control System intended to divert floodwaters of the Sacramento River away from the urban center of Sacramento and other flood-prone surrounding communities. The Yolo Bypass is 41 miles long and three miles wide; the seasonal floodplain supports significant wildlife-friendly agriculture and habitat for terrestrial and aquatic species. The northernmost "entrance" of the Bypass, the Fremont Weir, is located between the cities of Sacramento and Woodland in Yolo County. The Yolo Bypass then extends southerly for 41 miles along the Solano and Sacramento County border toward the City of Rio Vista and the Delta (USBR 2022), eventually emptying floodwaters into the Sacramento River through Cache Slough.

1.4.3 Ulatis Project

The Ulatis Project is a locally operated flood control project in the Vacaville-Elmira drainage basin (see Figure 1-9). The intent of the project is to control flows from areas north of Vacaville to the Liberty Island area of the Delta. The project was originally built by the Federal Soil Conservation Service but has been turned over to SCWA for operations and maintenance. The project was built by widening, deepening, and realigning 42 miles of natural stream channel. The actual stream channels are almost entirely on private property though SCWA has easements to access the channels for maintenance. The target is to control the 10-year recurrence level flood in local agricultural lands, though portions of the project have been upgraded to provide 100-year flood protection to the City of Vacaville. The channels of the Ulatis Project are unlined earth channels and some vegetation is allowed to maintain slope integrity.

Trees and woody vegetation are cleared to maintain adequate flood control capacity, and dredging is performed as needed. Some channels of the Ulatis Project are used by SID to convey agricultural irrigation water to Maine Prairie Water District during the irrigation season (SCWA 2023).

1.4.4 Solano Irrigation District Facilities

SID operates facilities to recover water draining off agricultural parcels and tail water recovery systems to reuse the water. These SID drainage/tail water recovery facilities also incidentally convey stormwater in the winter but are not designed for flood control function (SID 2015, Solano LAFCO 2014).

1.4.5 Reclamation Districts

There are a total of 25 reclamation districts throughout the County, of which 14 reclamation districts are located in the Suisun Marsh area and one reclamation district in the Collinsville area. Another 10 Solano County reclamation districts are located within the Sacramento Delta. The reclamation districts provide drainage and irrigation water to agricultural lands of specific islands in the Suisun Marsh and the Delta. These reclamation districts also work to protect agriculture along with wetlands, marsh lands, and waterfowl habitat (Solano County LAFCO 2020). For example, the Delta districts patrol, inspect, maintain, and repair over 146 miles of levees to protect property within their jurisdiction from flood waters, which are outside the levees maintained by the State as part of the State Plan of Flood Control (Solano County LAFCO 2020).

1.4.6 Resource Conservation Districts

Some drainage facilities are managed by local RCDs, including the Dixon RCD and Suisun RCD. Soil conservation districts were set up as part of state law in the late 1930s as a local counterpart to the National Soil Conservation Service. These Soil Conservation Districts were empowered to manage soil and water resources for conservation but over time have gained other powers and this is reflected in the change of name from “Soil” to “Resource” Conservation Districts. The Dixon RCD was specifically formed to construct, operate, and maintain the Dixon Drain and a network of 70 miles of ditches to minimize flooding on agricultural lands; some of the drains are used for incidental irrigation water conveyance (see Figure 1-9) (Solano County LAFCO 2014). Like SCWA, Dixon RCD leads, facilitates, and provides technical assistance to flood planning projects, landowners, and operators. , The Solano RCD does not provide drainage facilities but provides technical assistance to landowners in the areas of riparian habitat restoration, erosion control, water quality, irrigation management, and water conservation. (Solano County LAFCO 2014). The Suisun RCD was established in 1963 and represents private landowner and 115,000 acres in the Suisun Marsh (Suisun RCD).

1.4.7 Local Maintaining Agencies

Local maintaining agencies (LMAs) are public entities with the responsibility, liability, and duty to maintain and operate the Central Valley State-Federal flood protection systems. Within Solano County, LMAs can exist for the sole purpose of flood protection, or they can also be those agencies already identified in this and previous sections. Per the 2023 *Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System*, the following LMAs operate within Solano County:

- Reclamation District No. 0501 Ryer Island
- Reclamation District No. 0536 Egbert
- Reclamation District No. 2060 Hastings
- Reclamation District No. 2068 Yolano
- Reclamation District No. 2098 Cache and Haas Slough
- Reclamation District No. 2104 Peters Pocket Tract
- Brannan Andrus Levee Maintenance District
- Solano County Public Works Mellin Levee
- Fairfield-Suisun Sewer District (Channels)

Section 2: Regional Challenges and Issues

To better understand the County's water resources-related challenges, the County solicited input from the Steering Committee of staff from a broad range of agencies and districts as described in the Communications and Engagement Plan found in Appendix C. In addition to Solano County Resources Management Department staff, the agencies represented on the Steering Committee included the Cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville and Vallejo; the Dixon, Solano, and Suisun RCDs; Fairfield-Suisun Sewer District; Maine Prairie Water District; RDs 2068 and 501; Rural North Vacaville WD; Solano County Agricultural Commissioner, Solano County Farm Bureau; SCWA, SID, Vallejo Flood and Wastewater District, and Solano Transportation Authority. The Steering Committee met eight times from March 2023 to June 2024 with meetings organized by geography and topic with follow-up phone calls, and emails to gather additional information. Presentations can be found at https://www.solanocounty.com/depts/rm/delta_and_water_programs/one_water_framework/default.asp. During the meetings, Steering Committee members identified the region's most pressing challenges for various water resources including water supply and conveyance, wastewater management, and drainage, the areas in which those challenges were more pressing, as well as specific areas that these challenges were most prevalent. The challenges summarized in Section 2.4 for each Agricultural Area will help focus the Solano County Utilities Master Plan's efforts on finding integrated solutions that align with the One Water Goals described in Section 3.

2.1 Water Supply and Conveyance

As described in Section 1.2.8 and shown on Figure 1-7, entities within Solano County use a variety of water sources including groundwater and multiple surface water supplies from the Solano Project, State Water Project, Delta water rights and local sources to meet domestic, agricultural, and industrial demands. Water in the unincorporated County is supplied through a variety of public and private water purveyors, with access to different infrastructure to distribute and deliver water supplies throughout the county such as the North Bay Aqueduct, the Putah South Canal, and agricultural drainage facilities.

Based on input from Steering Committee members and documented data sets, water supply and conveyance issues for the unincorporated County can be categorized into **groundwater quality and supply**, **small water systems**, and **water supply to support agricultural economic growth** as summarized in the following sections:

2.1.1 Groundwater Quality and Supply

Groundwater is a major source of domestic and agricultural water supply, especially in parts of the County without access to potable surface water supply, such as the Jepson Prairie eastside of the Dixon region and large portions of the Western Hills Agricultural Areas, or areas outside a surface water supplier's jurisdiction along with some small communities including Collinsville. Some of these areas rely on wells drilled in fractured rock or small, isolated aquifers, which may be limited in supply or have poor water quality, or do not overlie an alluvial groundwater basin.

Therefore, the protection of these water supply sources is a high priority to safeguard public health, preserve the environment, and support the County's agricultural industry. Threats to the County's groundwater supply include man-made and naturally occurring constituents affecting water quality, impacts of climate change, and declining localized groundwater levels.

2.1.1.1 Potential Contamination of Domestic Wells by Septic Systems

As introduced in Section 1.2, in the unincorporated region, there are many small water systems and private well owners in the County, most of which rely on groundwater to meet their domestic demands. All wells within the State of California are required to comply with the California Well Standards[7] set by the State of California for the construction, alteration, maintenance, or destruction of wells for the protection of groundwater quality and prevention of pollution or contamination of groundwater. Per the Well Standards, the County has the authority to enforce these standards; however, while the County may be requested to inspect wells for compliance with the Well Standards, private well owners are not required to monitor or report the performance of their wells once the well is drilled, thus limiting the ability of the County to anticipate and mitigate threats to the groundwater supply from poorly maintained wells.

Potential Contamination of Domestic Wells by Septic Systems was identified as a challenge due to the lack of sewer services for the following Agricultural Regions:

- Western Hills
- Green Valley
- Suisun Valley
- Pleasants/Vaca/Lagoon Valleys
- Dixon Ridge
- Elmira/Maine Prairie
- Ryer Island
- Jepson Prairie

It is unknown if this is a challenge for the Montezuma Hills Agricultural Regions.

The challenge that the County faces in monitoring private well performance for potential water quality issues from septic system contamination is further exacerbated by the lack of information related to the operation and maintenance of septic systems. Small rural well systems or well owners in Solano County use distributed wastewater treatment systems or septic systems, as current law prevents service by Solano wastewater service providers outside of designated service boundaries (see Section 2.2 for further discussion of wastewater service area limitation). The County regulates the installation, repair, modification, and abandonment of septic systems discharging equal or less than 2,500 gpd (including proximity to private wells) but does not collect data on the operation or maintenance of these systems, with the exception of alternative septic systems[8]. On-site sewage disposal systems discharging greater than 2,500 gpd are under the jurisdiction of the Regional Water Quality Control Board. Similar to the above regarding private wells, this lack of information and reporting on septic systems limits the ability of the County to anticipate potential threats to the groundwater quality caused by poorly maintained or failing septic systems nearby, especially leaking septic systems in close proximity

7 California Department of Water Resources, *California Well Standards*, Bulletin 74.

8 Alternative systems may be used when a conventional system is insufficient and may include components such as pressure distribution systems, at-grade systems, mound systems, sand filtration. The County requires the property owner to renew the operation permit annually for these systems as well as submit a maintenance report every year (Solano County Environmental Health Division, 8/12/2024).

to a poorly maintained well. There are historical cases of groundwater quality issues caused by failing septic systems in the Suisun Valley area as indicated in Section 1.3.1.

2.1.1.2 Poor Groundwater Quality

Naturally occurring constituents including arsenic and hexavalent chromium may affect water supply sources for domestic use without adequate treatment. Although treatment technology is available, the costs and resources needed can limit access to groundwater treatment, especially for smaller systems or property owners with insufficient expertise or resources to operate the systems.

Poor Groundwater Quality was identified as a challenge based on SWRCB Aquifer Risk maps for the following Agricultural Regions:

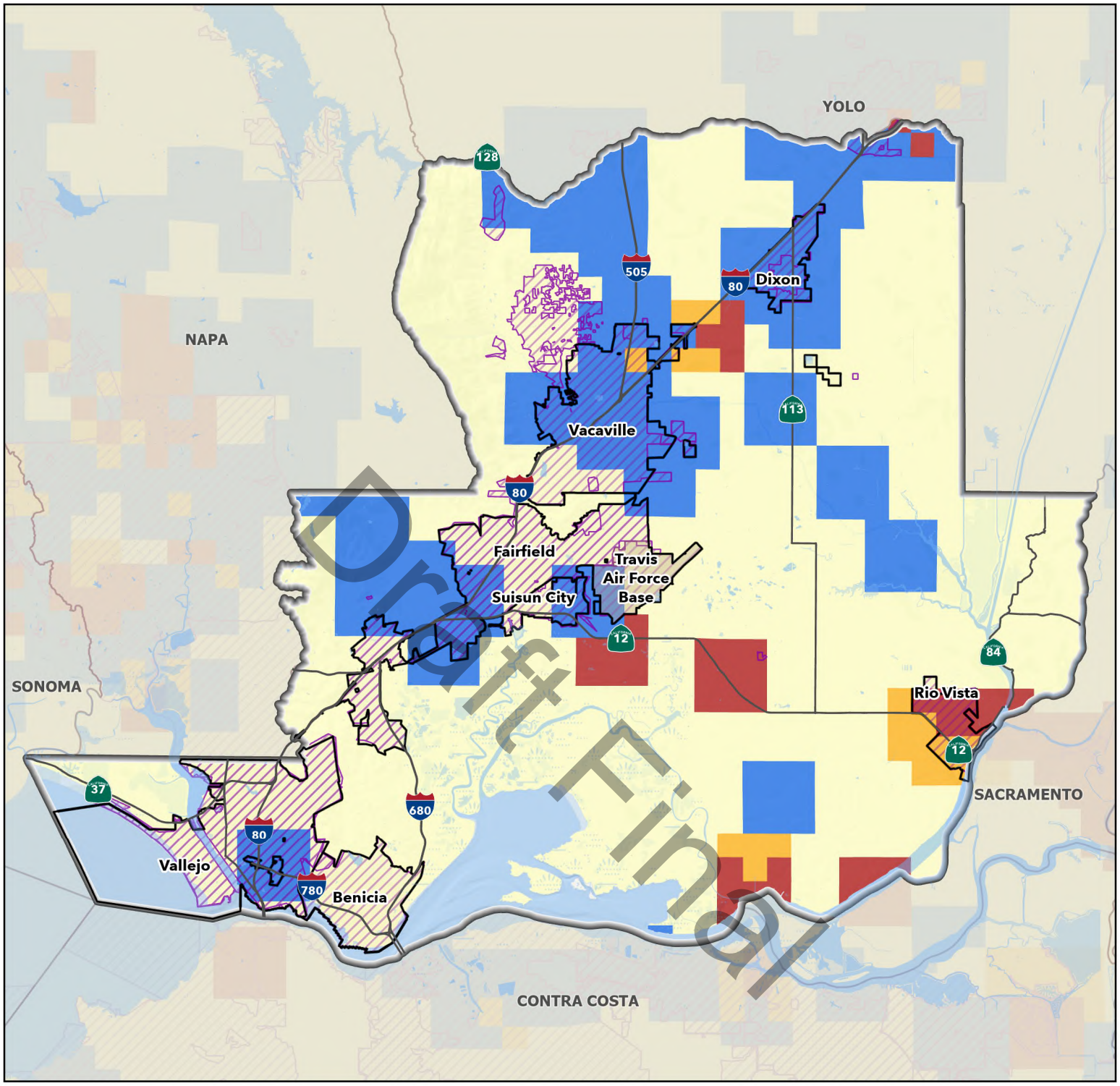
- Western Hills
- Green Valley
- Suisun Valley
- Pleasants/Vaca/Lagoon Valleys
- Winters
- Dixon Ridge
- Elmina/Maine Prairie
- Ryer Island
- Jepson Prairie
- Montezuma Hills

Arsenic is a semi-metal element that can occur naturally in the environment but can also be released to the environment by human activities. The maximum contaminant level (MCL) of arsenic in drinking water is 10 micrograms per liter (µg/L). The SWRCB-Division of Drinking Water (DDW) may further lower the MCL in the future. As shown on Figure 2-1, some areas in the eastern portion of the County are known to have naturally occurring arsenic. For example, elevated arsenic levels are found in wells in Rural North Vacaville Water District and Collinsville.

Hexavalent Chromium, a known human carcinogen, is also naturally occurring in the groundwater in some portions of the County. The MCL of hexavalent chromium was adopted by the SWRCB-DDW is effective 1 October 2024 at 10 µg/L. In addition to natural sources, hexavalent chromium enters drinking water sources through discharges of industrial materials such as dye and paint pigments, wood preservatives, chrome plating wastes, and leaching from hazardous waste sites. Hexavalent chromium has been identified in wells around the City of Vacaville (Figure 2-2).

Nitrate occurs naturally in the groundwater and can be contributed through human activity including leaking septic systems, agricultural drainage, or urban drainage. The MCL for nitrate is 10 mg/L as nitrogen. Excessive levels of nitrate in drinking water can cause serious illness and sometimes death. The serious illness in infants is due to the conversion of nitrate to nitrite by the body, which can interfere with the oxygen-carrying capacity of the child's blood. Elevated nitrate is documented in agriculture-dominated areas including the Dixon, Winters, Elmira Maine Prairie, Jepson Prairie, and Montezuma Hills Agricultural Areas. As shown on Figure 2-3, these eastern areas contain local nitrate plumes from identified sources of contamination.

As described in Section 1.2.5, brackish (saline) groundwater is common in the areas around the Suisun Marsh; therefore, groundwater is used only by those without access to surface water. Users of groundwater in these areas would likely use desalination technologies such as reverse osmosis to treat brackish water for drinking water, which is a costly process involving high energy use and the production of brine, which can be difficult to permit for disposal. Therefore, use of groundwater in these areas including nearby portions of Green and Suisun Valleys is limited, and new developments in these areas will likely need to ensure access to less saline



Groundwater - Arsenic Risk 2025

- high (> comparison concentration)
- medium (80% - 100% of comparison concentration)
- low (< 80% of comparison concentration)
- unknown
- California Drinking Water System Area Boundaries
- Travis Air Force Base
- City Boundary
- Solano County Boundary

Figure 2-1

Square mile sections are assessed on two metrics: average water quality over the last twenty years, and the highest recent sample from the last five years.
Source:
2025 Aquifer Risk Map Methodology State Water Resources Control Board - Division of Water Quality January 2025:
https://www.waterboards.ca.gov/water_issues/programs/gama/docs/armmethods25.pdf

Potential Water Quality Risk	Criteria
High	Twenty-year average OR highest recent sample is above the comparison concentration for one or more constituents
Medium	Twenty-year average OR highest recent sample are within 80% - 100% of comparison concentration for one or more constituents
Low	Twenty-year average AND highest recent sample are below 80% of the comparison concentration for all sampled constituents
Unknown	No water quality results meeting time or depth filters was available in this area

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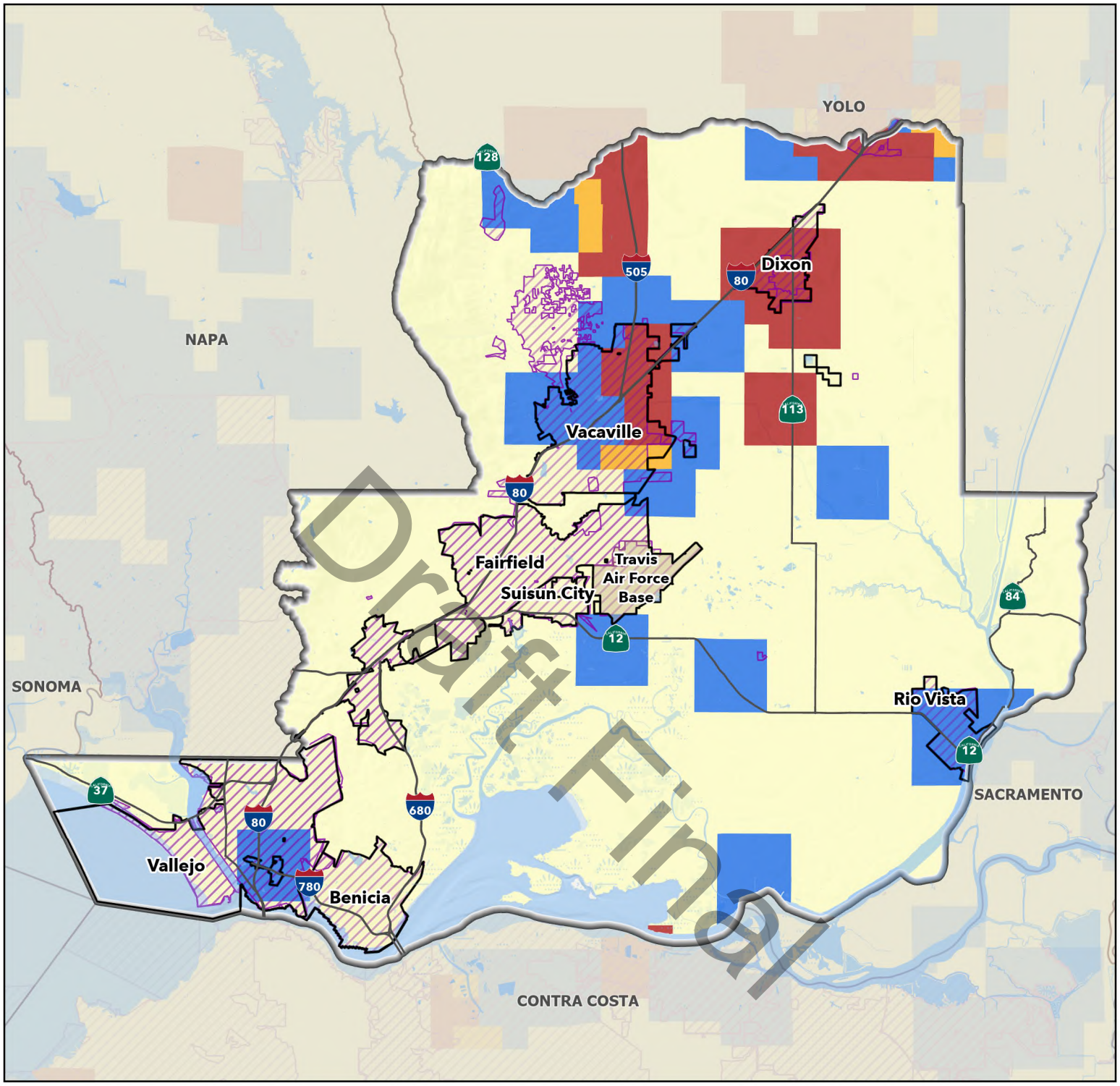

Groundwater - Hexavalent Chromium Risk 2025

- high (> comparison concentration)
- medium (80% - 100% of comparison concentration)
- low (< 80% of comparison concentration)
- unknown
- California Drinking Water System Area Boundaries
- Travis Air Force Base
- City Boundary
- Solano County Boundary

Figure 2-2

Square mile sections are assessed on two metrics: average water quality over the last twenty years, and the highest recent sample from the last five years.
Source:
2025 Aquifer Risk Map Methodology State Water Resources Control Board - Division of Water Quality January 2025: https://www.waterboards.ca.gov/water_issues/programs/gama/docs/armmethods25.pdf

Potential Water Quality Risk	Criteria
High	Twenty-year average OR highest recent sample is above the comparison concentration for one or more constituents
Medium	Twenty-year average OR highest recent sample are within 80% - 100% of comparison concentration for one or more constituents
Low	Twenty-year average AND highest recent sample are below 80% of the comparison concentration for all sampled constituents
Unknown	No water quality results meeting time or depth filters was available in this area

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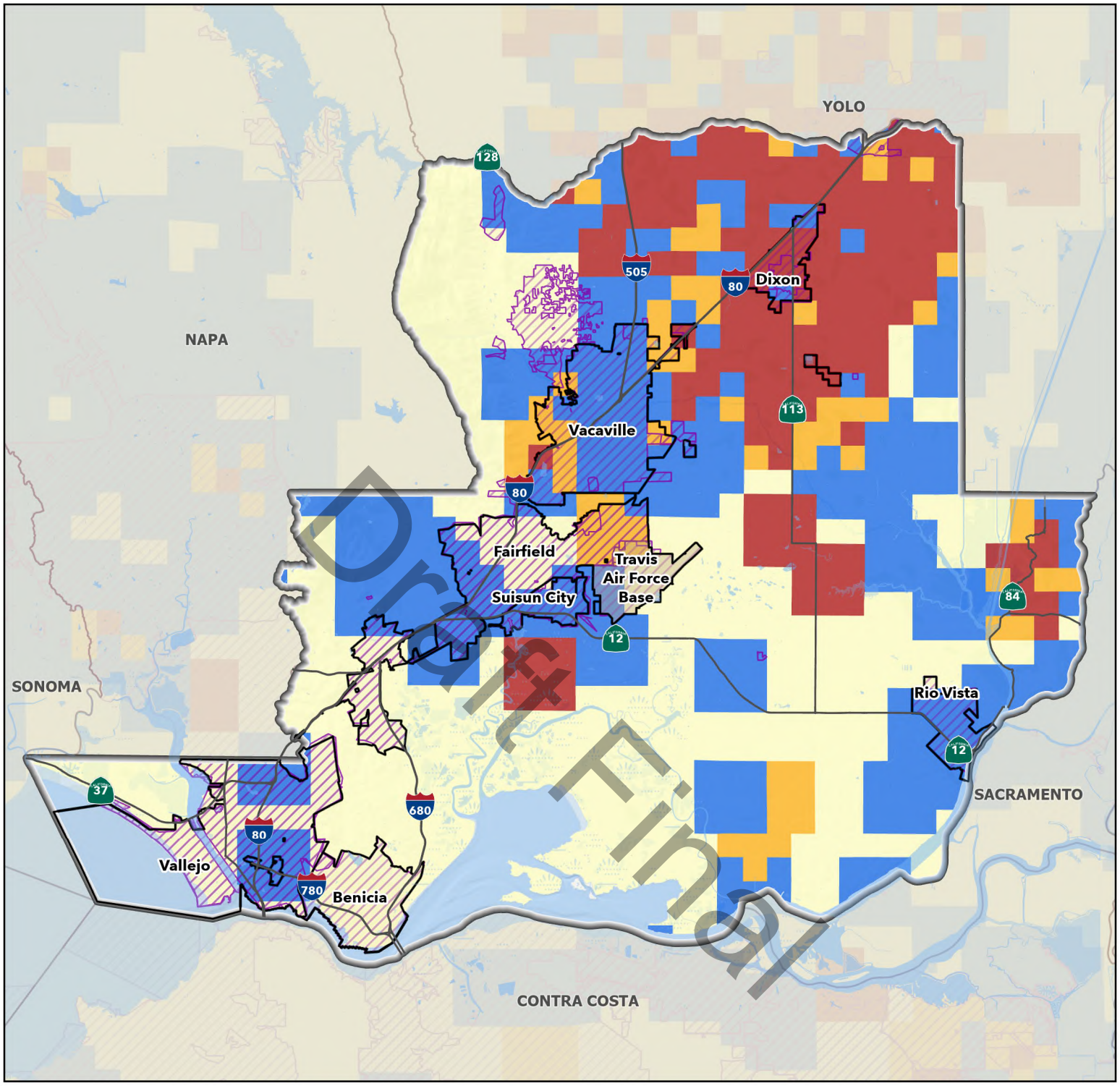

Groundwater - Nitrate Risk 2025

- high (> comparison concentration)
- medium (80% - 100% of comparison concentration)
- low (< 80% of comparison concentration)
- unknown
- California Drinking Water System Area Boundaries
- Travis Air Force Base
- City Boundary
- Solano County Boundary

Figure 2-3

Square mile sections are assessed on two metrics: average water quality over the last twenty years, and the highest recent sample from the last five years.
Source:
2025 Aquifer Risk Map Methodology State Water Resources Control Board - Division of Water Quality January 2025: https://www.waterboards.ca.gov/water_issues/programs/gama/docs/armmethods25.pdf

Potential Water Quality Risk	Criteria
High	Twenty-year average OR highest recent sample is above the comparison concentration for one or more constituents
Medium	Twenty-year average OR highest recent sample are within 80% - 100% of comparison concentration for one or more constituents
Low	Twenty-year average AND highest recent sample are below 80% of the comparison concentration for all sampled constituents
Unknown	No water quality results meeting time or depth filters was available in this area

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sources of water such as surface water. These areas along the western Bayshore and Suisun Marsh regions are also subject to sea level rise and climatic changes that may result in shallow brackish groundwater that could impact agricultural crops.

2.1.1.3 Declining Groundwater Levels to Meet Demands

Of the four groundwater basins and subbasins underlying Solano County, the Solano Subbasin and Suisun-Fairfield Valley Basin (SFV Basin) are the two primary sources for agricultural and domestic supply in Solano County, both of which are vulnerable to declining groundwater levels in localized areas. The private wells completed in fractured rock formations, such as the Western Hills, are especially vulnerable during drought.

Declining Groundwater Levels to Meet Demands was identified as a challenge for the following Agricultural Regions based on the Solano Subbasin GSP and hydrograph records:

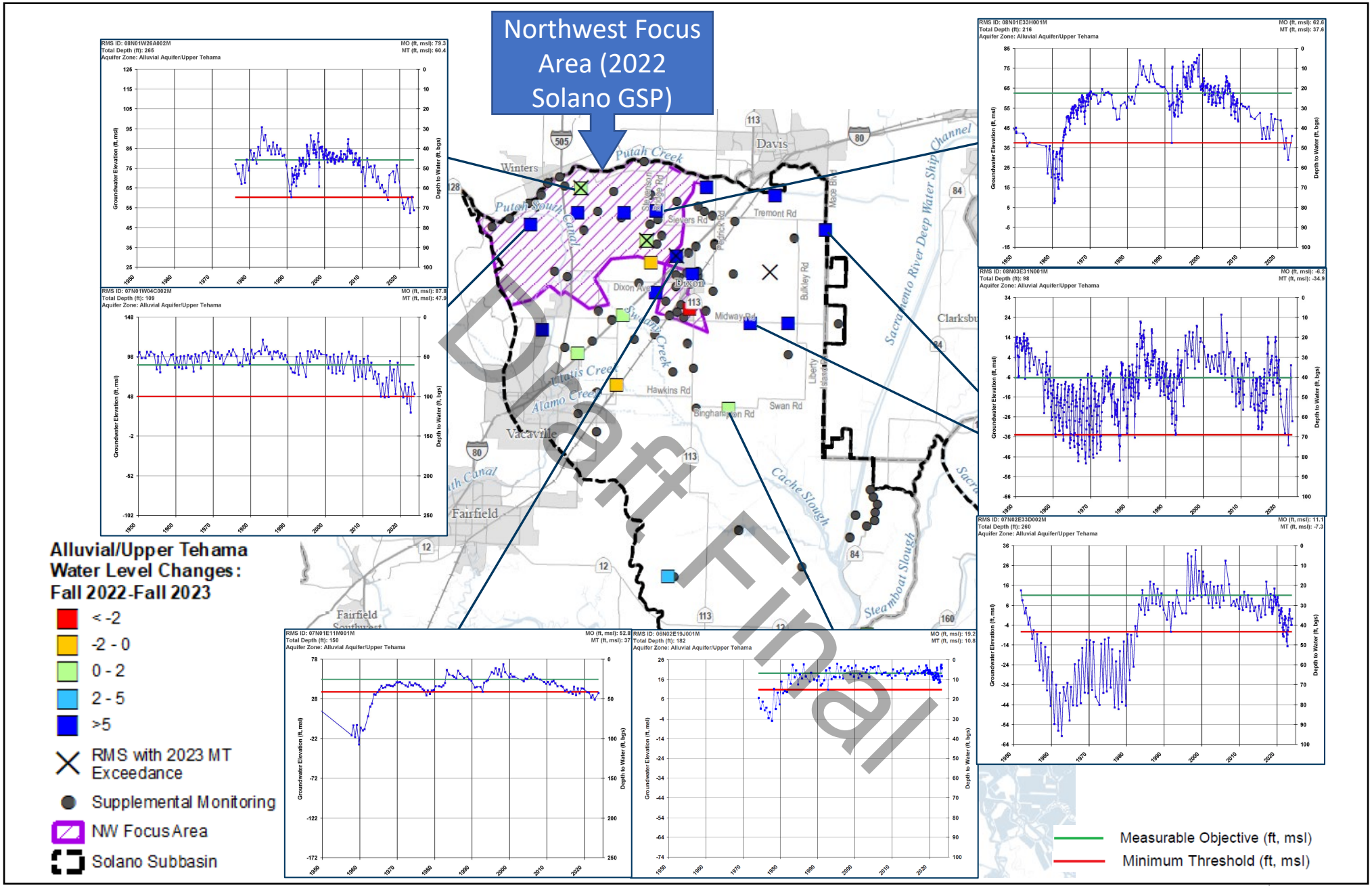
- Western Hills
- Pleasants/Vaca/Lagoon Valleys
- Winters
- Dixon Ridge

As described in Section 1.2.3, the Solano Subbasin GSP contains estimates of groundwater pumping and conditions of the Subbasin. According to the Solano Subbasin GSP, there is documented groundwater decline in the Northwest Focus Area (shown on Figure 2-4). The Solano Subbasin GSP describes the Northwest Focus Area as vulnerable to declining groundwater levels that decreased approximately 10 feet between 1988 and 2018. As shown on Figure 2-4 only a portion of the Northwest Focus Area is within the SID service area and therefore receiving surface water supply from the Solano Project or SWP (City of Vacaville).

The elevation of shallow groundwater aquifers reported in the GSP shows seasonal changes from spring to fall during the height of agricultural production, which is then replenished (i.e., groundwater elevations go back up from direct percolation of rainfall and return flows of applied water by agricultural and municipal users) from fall to spring, when agricultural activities are reduced.

However, during the recent prolonged drought there were areas identified as having declining groundwater levels. As of winter of 2023, seven dry wells were reported to Solano County in the northwestern tip of the northwest focus area of the Solano Subbasin (north of Vacaville, south of Winters and west of Interstate 505). The Solano Subbasin Collaborative has agreed to prioritize activities such as groundwater level monitoring and recharge in order to help restore groundwater levels in the Northwest Focus Area to meet demands.

As described in Section 1.2.5, the Fairfield-Suisun Valley Groundwater Basin is not required to be managed under SGMA. Therefore, no regional assessment exists on the capacity of the groundwater basin, pumping demands, water quality, or other factors regarding the long-term viability of the groundwater resource in Suisun Valley to meet domestic and agricultural demands. Limited historical data indicate that wells completed in fractured rock zones on the western portion of Suisun Valley may have experienced declining groundwater levels especially during prolonged periods of drought. However, there is evidence of highly fluctuating or lower groundwater levels in Suisun Valley prior to the delivery of Solano Project water around 1960 as indicated in some of the hydrographs presented in Figure 2-5 (e.g., 05N02W30J001M & 05N02W21P003M). Additionally, groundwater in the southern portion of the Fairfield-Suisun Valley Basin may experience elevated salinity or brackish groundwater due to increased sea levels and proximity to Suisun Marsh.

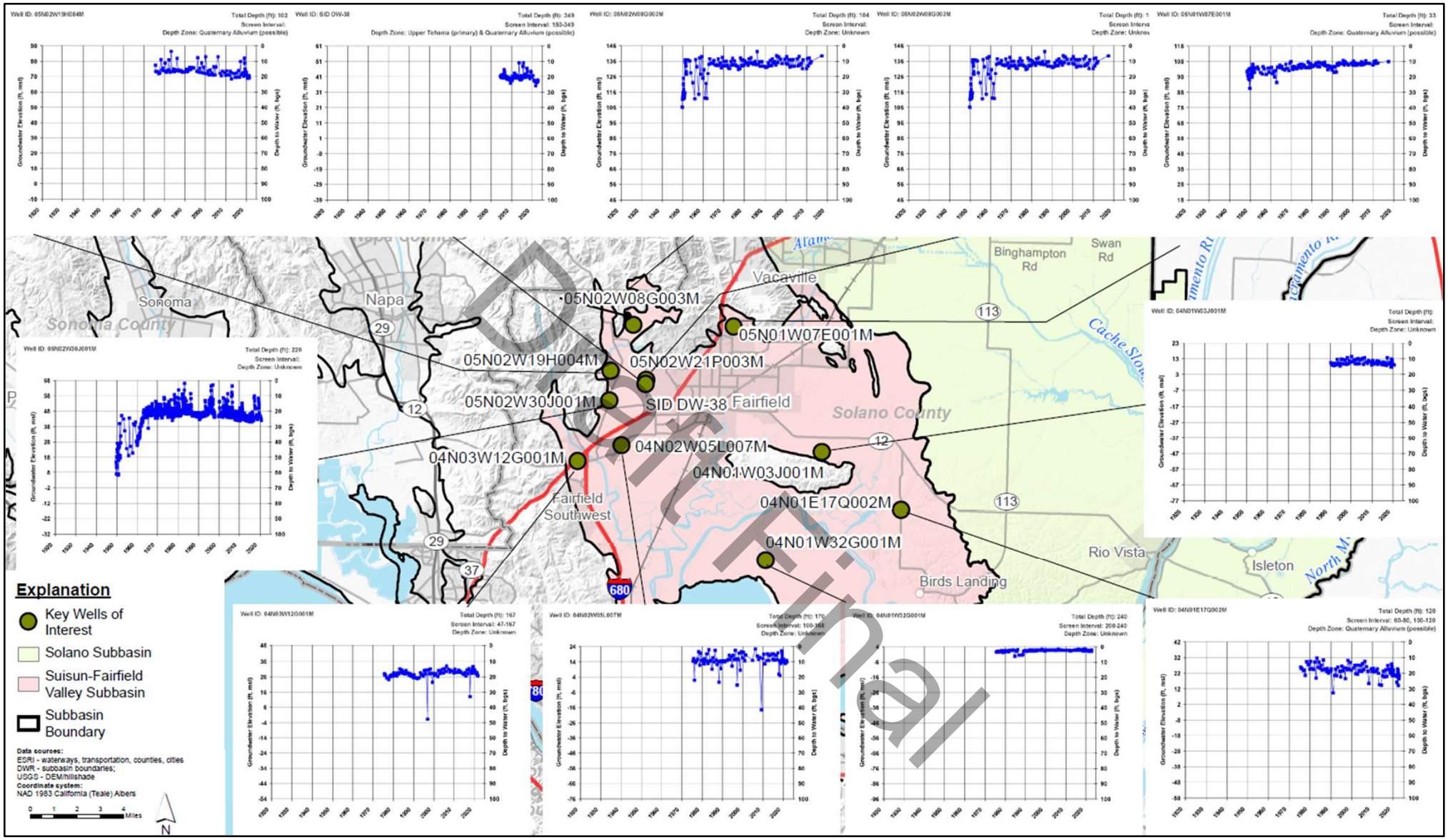


Kennedy Jenks

Solano County, California

Fall 2023 Groundwater Conditions
Eastside Solano County

Figure 2-4



Kennedy Jenks

Solano County, California

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2023 Groundwater Conditions
Westside Solano County

Figure 2-5

2.1.1.4 Data Gaps

To evaluate the challenges and identify further actions to take related to groundwater quality and supply, the following information is needed and should be focused on areas where data is not currently available:

- Inventory of domestic wells, including location, construction, water quality, water levels, pumping volumes, and use (agricultural irrigation/domestic).
- Septic system inventory, including location, construction, and performance.
- Long-term data to support characterization of SFV Basin groundwater sustainability, including groundwater levels, storage capacity, groundwater quality, pumping volumes.
- Understanding of agricultural water use, including supplies used, locations, and volumes.

2.1.2 Small Water System (SWS)

It is notable that there are almost no Public Water Systems in the agriculturally-dominated far eastern side of the County indicating a low density of residences and businesses.

As indicated in Section 1.2.8 and shown on Figure 1-7, Solano County contains various water systems within the County: large "urban suppliers", rural public water systems including SID, Vallejo Lakes Water System and Rural North Vacaville Water District, community water systems, non-potable systems, and non-community non transient systems regulated by the SWRCB-DDW and County regulated state small water systems. Regardless of size, all of these water systems are required to meet minimum California Water Code Titles 17 and 22 regulations for water quality and flow rate for protecting human health, in addition to the local and State well standards as applicable. However, while larger systems are able to rely on a larger rate payer base to sustain the financial capital needed to operate and maintain a water system, systems with smaller rate payer base often struggle with the cost of maintenance and complying with primary drinking water standards.

The SWRCB Safe and Affordable Funding for Equity and Resilience (SAFER) Drinking Water Program conducted a Drinking Water Needs Assessment and evaluated the vulnerability of public water systems, state small water systems, and domestic wells throughout the state. The SAFER Drinking Water Needs Assessment evaluated water systems of both surface water and groundwater supplies based on:

Although the SAFER evaluation was conducted on a subset of all the water service providers and communities in Solano County (i.e., public water systems), it can be used to flag potential challenges faced by other small water system and communities.

- Compliance with primary drinking water standards;
- Public Water System risk indicators for water quality, accessibility, affordability, and technical, managerial, and financial (TMF) capacity;
- State Small Water System and domestic well risk indicators for water quality, water shortage, and socioeconomic risk;
- Tribal Water System needs;
- Costs related to implementing solutions for systems that were identified as Failing, At Risk, or Potentially At-Risk; and,
- Affordability indicators for community water systems serving disadvantaged communities.

The State Board published the results of the Drinking Water Needs Assessment in an April 2023

report[9] and via an online dashboard. Based on the results summarized in Table 2-1, of the 17 public water systems evaluated in Solano County, nine public water systems were evaluated as Failing, At-Risk, and Potentially At-Risk public water system[10] (PWS), and seven of those systems are located outside municipal boundaries. Based on the SAFER results, these seven systems have the greatest vulnerability to water quality, followed by accessibility, as discussed in the following sections. The 2024 SAFER dashboard evaluated 26 public water systems in Solano County and identified 5 systems that fall into the categories as potential at risk, at risk, or failing due to lack of inter-tie or redundancy that makes these systems vulnerable.

Table 2-1: SAFER Results for Unincorporated Solano County

PWS ID	System Name	Popu-lation	Water Quality Risk Level	Access-ibility Risk Level	Afford-ability Risk Level	TMF Capacity Risk Level	Agri-cultural Region
SAFER Status: Failing (2)							
CA4800561	Snug Harbor RV LP	125	High Risk	Low Risk	No Risk	High Risk	Ryer Island
CA4810025	SID – Pleasant Hills Ranch Estates	89	High Risk	Low Risk	High Risk	Medium Risk	Pleasants/ Vaca Valley
SAFER Status: At-Risk (1)							
CA4800511	Collinsville Waterworks	25	High Risk	High Risk	High Risk	No Risk	Montezuma Hills
SAFER Status: Potentially At-Risk (6)							
CA4800589	Cresta Mesa Parque	25	High Risk	High Risk	No Risk	No Risk	Western Hills
CA4810012	SID – Quail Canyon	132	No Risk	High Risk	High Risk	No Risk	Western Hills
CA4810013	Rural North Vacaville Water District	1,313	High Risk	Low Risk	Low Risk	No Risk	Western Hills
CA4810024	SID – Blue Ridge Oaks	63	No Risk	High Risk	High Risk	Low Risk	Western Hills

Note:
A total of 17 PWS were evaluated in Solano County; this table shows only those systems in unincorporated Solano County that were evaluated as Failing, At-Risk, and Potentially At-Risk by the SAFER Drinking Water Needs Assessment. California Water Service Company - Dixon and California State Prison – Solano were also evaluated as Potentially At-Risk but are within the incorporated areas of the County. For further explanation of SAFER risk indicators, refer to the 2023 Drinking Water Needs Assessment.

9 State Water Resources Control Board, 2023 Drinking Water Needs Assessment, April 2023. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html

10 See Section 1.2.8.7 and Table 1-7 for a summary of public water system types

2.1.2.1 Lack of Drinking Water Supply

SID and Rural North Vacaville Water District (RNVWD) provide water service to most of the population outside of the municipal areas of Solano County. In addition to those shown in Table 2-1, SID is responsible for 17 other public and non-public domestic water systems in the County (for a total of 20), as shown on Figure 1-7, providing a combination of non-potable supply, potable drinking water, raw water to homes with point-of-entry treatment, and distribution system operations.

A summary of SID's domestic water systems is listed in Table 2-2 and described in the following:

Lack of Drinking Water Supply including capacity, back-up supplies, water quality and supply for fire flow was identified as a challenge for some smaller water systems based on the SAFER results in the following Agricultural Regions:

- Western Hills
- Green Valley
- Suisun Valley
- Pleasants/Vaca/Lagoon Valleys

It is unknown if this is a challenge for the Elmira/Maine Prairie, Ryer Island, Jepson Prairie, or Montezuma Hills Agricultural Regions.

Table 2-2: Solano Irrigation District Domestic Water Systems

System Name	Number of Connections	Service(s) Provided
Allison/Ulatis	41	Non-potable irrigation (Vacaville provides potable source/distribution services)
Blue Ridge Oaks (Public System)	19	Potable distribution only (Fairfield provides source)
Blue Ridge Oaks (Non-Public System)	23	Non-potable irrigation
Elmira	88	Potable source/distribution
Fairfield Corporate Commons	18	Non-potable irrigation (Fairfield provides potable source/distribution services)
Gibson Canyon (Public System)	162	Potable source/distribution
Gibson Canyon (Non-Public System)	6	Non-potable distribution w/ POE treatment, bottled water
Green Valley – Lower	353	Not available
Green Valley – Middle	Not available	Not available
Green Valley – Upper	Not available	Non-potable irrigation (Vallejo provides potable source/distribution services)
North Cordelia	88	Non-potable irrigation (Fairfield provides potable source/distribution services)
North Village	31	Non-potable irrigation (Vacaville provides potable source/distribution services)
Nut Tree	26	Non-potable irrigation (Vacaville provides potable source/distribution services)
Paradise Valley	Not available	Non-potable irrigation (Fairfield provides potable source/distribution services)
Peabody	17	Potable distribution/non-potable irrigation (Fairfield provides potable source)
Pleasant Hills Ranch Estates	27	Potable source/distribution
Quail Canyon	31	Potable source/distribution
Stocking Ranch	6	Potable source/distribution
Suisun Valley	5	Potable source/distribution w/ POE treatment
Tolenas (Public System)	192	Potable distribution only (SSWA provides source)
Tolenas (Non-Public System)	Not available	Non-potable distribution (Vallejo provides source)
Vaca Valley	90	Potable source/distribution w/ POE treatment

- The Suisun Valley System, Vaca Valley System, and a portion of the Gibson Canyon System are required by DDW to use individual point-of-entry (POE) treatment at homes receiving raw Solano Project water, as treated potable water is not available through either SID or another nearby potable system.

SID's POE systems were formed after to the adoption of EPA's Surface Water Treatment Rules which require specific treatment levels of surface water prior to delivery of drinking water to customers.

- SID's Quail Canyon and Stocking Ranch Systems both rely on only one groundwater well each to meet demands, and neither well would be able to deliver the required fire flow demands. Declining groundwater levels have also been observed in the existing Quail Canyon well.

SID has obtained USEPA funding to drill an additional well in the Solano Subbasin for the Quail Canyon to provide redundancy and water supply reliability.

- SID's Tolenas System is supplied potable water by a single pipeline to the SID Suisun-Solano Water Authority with no redundancy of supply.

- According to the RNVWD April 2022 Municipal Service Review (MSR), although the District's two wells are sufficient to meet current demands, there is potential for expansion of the customer base beyond its capacity to provide water due to future splits and annexations of parcels within the District's boundaries. SID operates the RNVWD distribution system under contract, in addition to providing O&M services. More than half of the District does not overlie a groundwater basin, limiting its opportunities for expanding its groundwater production capacity.

- As mentioned in Sections 1.2.5, 1.2.6, and 2.1.1, the water quality in the southern portion of the SFV Basin is brackish, especially along the shoreline area and unsuitable for drinking water use without treatment or desalination. SID's Suisun Valley and Tolenas Systems overlie the SFV Basin but do not rely on groundwater from the basin to supply the system. The SID systems rely on other water sources outside of the SFV Basin, but also have no or limited access to other water supplies for redundancy purposes. Similarly, Gibson Canyon, and Vaca Valley Systems rely on water sources outside of the service area as these systems overlie areas of fractured rock and not within a recognized alluvial groundwater basin. Therefore, either do not meet water quality or capacity requirements per the SAFER assessment.

The Middle Green Valley community is an area in Solano County that has potential for significant population growth and water, sewer, flood, and other utilities to support that growth are in development. The Middle Green Valley Specific Plan discusses potential utility providers and is therefore not discussed in detail in the Solano One Water Framework. The potential for future developments in unincorporated Solano County exists and may inform the development and/or update of the Solano County Utilities Master Plan.

A few of the SID's small systems and RNVWD struggle with meeting California Water Code capacity requirements for backup supplies, water quality and meeting demands (including fire

flows)[11]. Although SID is a contract holder of Solano Project water, Solano Project place of use was established in the 1950s and is limited to specific areas, which do not coincide with any of these small systems. Therefore, groundwater supply is to be relied upon as the water source, which can be limiting at times. Since 2000, SID has been seeking grant funding to consolidate their small systems with other nearby systems that either already have a surface water treatment plant or could support the cost of a new treatment plant, to provide these systems with more reliable drinking water supplies. SID is also a member of and operates Suisun-Solano Water Authority facilities as a JEPA, which serves the City of Suisun City.

Although not identified as a vulnerable system through SAFER, the City of Vallejo Lakes Water System lacks sufficient capacity to meet future drinking water demands. This limitation is due to the size of the water treatment plant. However, fire flow requirements remain insufficient to serve both existing and anticipated new connections in the service area. An evaluation of the Lakes Water System conducted in 2018[12] identified the following issues and needs related to domestic water supply:

- Existing Green Valley Water Treatment Plant limits the growth of the Lakes Water System. Within the Lakes Water System, there is the potential for 496 new connections from build-out of existing parcels, but the Green Valley Water Treatment Plant only has capacity for an additional 100 connections. The water treatment size was limited to 1 MGD at the request of landowners and homeowners in the area.

  The City of Vallejo is currently conducting a study on an Auxiliary Supply Feasibility Study of the Lakes Water System.

- The Lakes Water System does not have sufficient fire flow storage or delivery infrastructure to serve current and future connections. The City is in the process of finalizing a moratorium on new connections or "will serve" letters in the Lakes Water System, as the water treatment plant has reached capacity.

As noted above, the challenges related to the lack of drinking supply include redundant water supply, fire flow requirements, declining groundwater table and storage, and limitations on existing infrastructure.

[11] California Waterworks Standards (Chapter 16 of California Code of Regulations Title 22) requires community water systems that use only groundwater to have at least two approved sources of water and be able to meet maximum day demand (MDD) with the highest source offline.

[12] Brown and Caldwell. Technical Memorandum [No. 1], Subject: Lakes Water System Evaluation – Phase 1. Prepared for Solano County Department of Resource Management. Revised 22 May 2018.

2.1.2.2 Limited Rate Payer Base

Although the challenges of small water systems can also apply to larger systems, these challenges are further exacerbated by the limited number of water service customers in a small system to help pay for capital projects and operations and management of the system. The SAFER analysis included a review of water system affordability based on the following:

- Percentage Median Household Income (% MHI): Percentage of water bill for each system relative to the median household income in the service area.
- Extreme Water Bill: Percentage of water bill for each system relative to the statewide average water bill.
- Housing Burden Percent: Percentage of households in a water system's service area that are both low-income and severely burdened by housing costs (paying greater than 50% of their income for housing costs).

Limited Rate Payer Base was identified as a challenge for the following Agricultural Regions:

- Western Hills
- Green Valley
- Suisun Valley
- Pleasants/Vaca/Lagoon Valleys
- Montezuma Hills

It is unknown if this is a challenge for the Winters, Dixon Ridge, Elmira/Maine Prairie, Ryer Island, or Jepson Prairie Agricultural Regions.

Table 2-3 presents the water systems in Unincorporated Solano County that were evaluated as vulnerable (assessment scores >0) for any of the three SAFER affordability metrics in 2023.

Table 2-3: SAFER Affordability Results for Vulnerable Water Systems in Unincorporated Solano County (2023)

System Name	Number of Connections	%MHI	Extreme Water Bill	Housing Burden
Rural North Vacaville Water District	398	1.42%	198%	12.78%
Peabody (SID)	17	1.44%	227%	10.85%
Quail Canyon (SID)	31	1.83%	258%	12.79%
Pleasant Hills Ranch (SID)	27	2.40%	338%	12.79%
Gibson Canyon (SID)	162	2.78%	357%	12.78%
Blue Ridge Oaks (SID)	19	3.08%	386%	10.51%
Lakes System (City of Vallejo)	852	1.02%	129%	17.09%
Collinsville Waterworks	15	Missing	Missing	13.69%

Definitions:
%MHI: Percentage of water bill for each system relative to the median household income in the service area.
Extreme Water Bill: Percentage of water bill for each system relative to the statewide average water bill.
Housing Burden: Percentage of households in a water system's service area that are both low-income and severely burdened by housing costs (paying greater than 50% of their income for housing costs).

According to SID's 2021 Water Rate Study, Pleasants Valley, Blue Ridge Oaks, Green Valley, Peabody, Gibson Canyon, and Tolenas water systems did not have the required operating cash reserves as of 31 December 2020. These systems all serve less than 200 connections each. Moreover, despite average water bills over 3 times the statewide average, the Pleasant Hills Ranch Estates operates at a loss (income is less than expenses) of over $300,000 to operate and maintain a surface water treatment plant as required by the State of California for 27 connections; this situation was exacerbated by the LNU Complex fire in 2020, which destroyed 19 homes connected to the water system, further reducing the rate base.

SID has been seeking funding to consolidate their smaller systems. Preliminary planning has started for the consolidation of the Pleasant Hills Ranch Estates, Vaca Valley, and Gibson Canyon potable and non-potable water systems, which are all located within 2-3 miles of each other.

The City of Vallejo Lakes Water System, including the Green Valley Water Treatment Plant and Green Valley Pipeline, is aging and in need of upgrades in order to continue to provide potable water service to the parcels within its boundaries; however, its existing customer base is already paying high rates to maintain the current system as summarized in Table 2-3. The City of Vallejo Lakes Water System Auxiliary Supply Feasibility Study will evaluate options for making upgrades and improvements while keeping water rates affordable.

2.1.2.3 Meeting Water Quality Regulations

As shown in Table 2-1, the SAFER Drinking Water Needs Assessment identified five of the seven public water systems in the unincorporated county as at high risk for water quality. As described in Section 2.1.1.2; arsenic, hexavalent chromium, and nitrate are all regulated constituents of concern found in the groundwater of users within Solano County. Although treatment for these constituents is available, small water systems may struggle to come up with the funding to install and/or operate these systems.

Meeting Water Quality Regulations was identified as a challenge for the following Agricultural Regions:

- Western Hills
- Pleasants/Vaca/Lagoon Valleys
- Dixon Ridge
- Ryer Island
- Montezuma Hills

It is unknown if this is a challenge for the Green Valley, Suisun Valley, Winters, Elmira/Maine Prairie, or Jepson Prairie Agricultural Regions.

Even when small water systems come into compliance with water quality standards, changing regulations mean that small water systems will need to continuously find the additional capital or technical/operational resources to comply which will be a great challenge in the future. It is anticipated that the MCLs for arsenic and hexavalent chromium could be reduced further in the near future:

- Small community water systems and non-transient non-community water systems accounted for over 86% of the total arsenic MCL violations for the State of California from 2015-2019. DDW is evaluating the technological and economic feasibility of

lowering the MCL for arsenic below the current California and EPA MCL of 10 µg/L. Rulemaking is in progress as of July 2024[13].

- Since 2017, DDW had been evaluating the economic feasibility of lowering the state-established MCL for hexavalent chromium from 50 µg/L to 10 µg/L. The lowered MCL was established in 2014 but invalidated by the Superior Court of Sacramento County in 2017 due to the lack of documentation for economic feasibility. Since then, the State Water Board published the *White Paper Discussion on Economic Feasibility Analysis in Consideration of a Hexavalent Chromium Maximum Level*[14] and began rulemaking in August 2023. Rulemaking was completed and adopted by the State Water Board on 17 April 2024. It is expected that this change will cost water systems with fewer than 100 connections an average of $135/month[15].

- In California, small community water systems, non-transient non-community water systems, and transient non-community water systems accounted for almost all (over 98%) of the MCL violations for nitrate in California from 2015-2019.

2.1.2.4 Data Gaps

To evaluate the challenges and identify further actions to take related to small water systems, the following information, much of which has been collected, should be updated periodically:

- Current inventory of all water systems, including public and non-public water systems, small and state small water systems including each system's location, number of connections/customers, capacities, types and amounts of supplies, water quality information, and demands.

- Current map of all water service provider boundaries and spheres of influence.

2.1.3 Adequacy of Water Supply to Support Agricultural Economic Growth

There are areas within Solano County that have been identified for agricultural growth in the General Plan in the form of agricultural support services or tourism, shown on Figure 2-6 and Figure 2-7:

- **Suisun Valley Agriculture (ASV-20)** region preserves and enhances the environment and economy of the Suisun Valley as a rural

Adequacy of Water Supply to Support Agricultural Economic Growth was identified as a challenge for the following Agricultural Regions:

- Suisun Valley
- Dixon Ridge

13 State Water Board. "Arsenic MCL Revision (SWRCB-DDW-23-002)." https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/swrcb-ddw-23-002.html. Accessed 12 August 2024.

14 State Water Board. White Paper Discussion on Economic Feasibility Analysis in Consideration of a Hexavalent Chromium Maximum Level. February 2020.

15 Becker, Rachel. "California sets nation's first water standard for cancer-causing contaminant." CalMatters. 17 April 2024. Accessed 18 April 2024. https://calmatters.org/environment/water/2024/04/california-water-standard-chromium/

agricultural community by maintaining the agricultural character, improving agricultural production and income, promoting agricultural products grown in Solano, and providing for agricultural tourist centers. The Upper Suisun Valley is an area where agricultural-supported businesses are likely to occur and is mostly comprised of vineyard and small-scale wine production. These areas may lie within the service area boundaries of SID/SSWA and/or the Vallejo Lakes Water System.

- **Agriculture Tourist Centers (ATCs)** allow a variety of uses that help foster small tourist-oriented centers within the Valley, attract tourists, and provide additional opportunities to market local products. These can also include small wineries with restaurants, hotels or bed and breakfasts, or event spaces. These areas may lie within the service area boundaries of SID/SSWA and/or the Vallejo Lakes Water System.

- The Solano County General Plan allows the **Dixon Limited Industrial Land** area to be used for agricultural services such as the storage or sales of products for commercial agriculture, agricultural processing, and corporation yards for the storage and maintenance of agricultural equipment. This area is located outside of the City of Dixon Sphere of Influence and is not anticipated for annexation within the planning horizon of the 2040 City General Plan.[16] This area is not located within the SID service area boundary.

- The Solano County General Plan allows the **North Vacaville Limited Industrial Land** area to be used for agricultural-related support uses such as industrial operations, scientific and research institutions, warehousing and distribution, and specialized light manufacturing and assembly operations with few or no off-site effects. This area is within the area identified as the Northeast Growth Area in the City of Vacaville 2017 MSR and will not be considered for annexation by the City of Vacaville until after the 5- to 10-year planning period of the most current MSR and Comprehensive Annexation Plan. This area is located within the SID service area boundary but may require infrastructure to access SID water supply.

In order for these areas to develop to their economic potential, water service or water supplies are needed, not just for the growing of vineyards and similar crops, but also to support agricultural processing, large-scale greenhouses and other agricultural industries as well as domestic demands related to short-term stays, employee housing, and restaurants. The Dixon and North Vacaville Limited Industrial Land are currently located outside of municipal service area boundaries, and it is not currently anticipated that they would receive water supply to support these agricultural services until or unless they are annexed by the cities or SID. Most and portions of the Suisun Valley are in the SID and SSWA/Lakes Water System service areas, respectively. However, the current infrastructure may not have sufficient capacity and reach to accommodate future land use changes that may require additional water supply.

Private groundwater wells may be the other water supply option for these types of development. Lands designated as ASV-20 and ATCs overlie a portion of the SFV Basin with historical well data showing shallow and relatively stable groundwater levels overall, except for a few wells showing slight water level decline and groundwater quality suitable for most purposes, if managed sustainably. However, the portion of the SFV Basin south of Interstate-80 is higher in

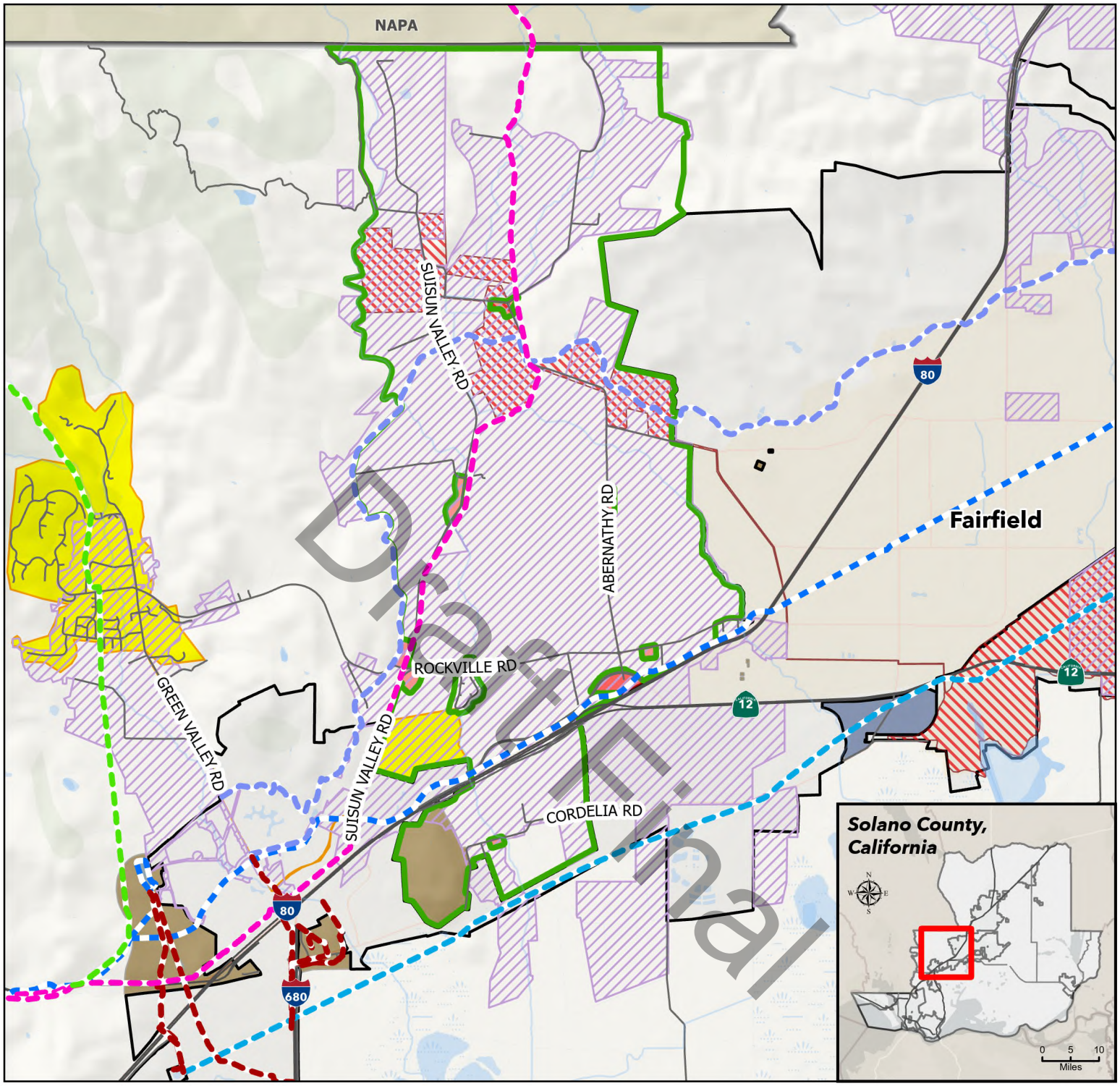
[16] City of Dixon, General Plan 2040. Adopted May 2021.

salinity due to the proximity of the Suisun Marsh, and groundwater pumping in this basin should be managed in a way that prevents over pumping and saltwater intrusion. The Dixon Limited Industrial Land and North Vacaville Industrial Land use areas both overlie the portion of the Solano Subbasin outside of the Northwest Focus Area, where groundwater is managed under the Solano GSP.

2.1.3.1 Data Gaps

To evaluate the water supply challenges and identify further actions to take related to support of agricultural economic growth, the following information is needed relative to specific parcels identified for agricultural support services or tourism:

- Develop and maintain map of water service provider boundaries, infrastructure and spheres of influence.
- Future demands and locations of demands.
- Magnitude of costs for new water supply conveyance infrastructure.
- Characterization of the Suisun-Fairfield Valley Basin and development of a groundwater monitoring network for water levels and quality.



Suisun Valley Water Systems and Agricultural Tourist Centers

Figure 2-6

- Suisun Solano Water Authority
- Solano Irrigation District (SID) Service Area
- Vallejo Lakes Water System

Main Water Conveyance

- Putah South Canal
- Cordelia Transmission Line
- Gordon Valley Transmission Line
- Trans Green Valley Transmission Line
- North Bay Aquaduct
- Trans Cache Transmission

Solano County Unincorporated Zoning

- ATC - Agricultural Tourist Center
- ATC-NC - Agricultural Tourist Center - North Connector
- ASV-20 Suisun Valley Agriculture Region
- Fairfield Sphere of Influence
- Suisun City Sphere of Influence
- City Boundary
- Solano County Boundary

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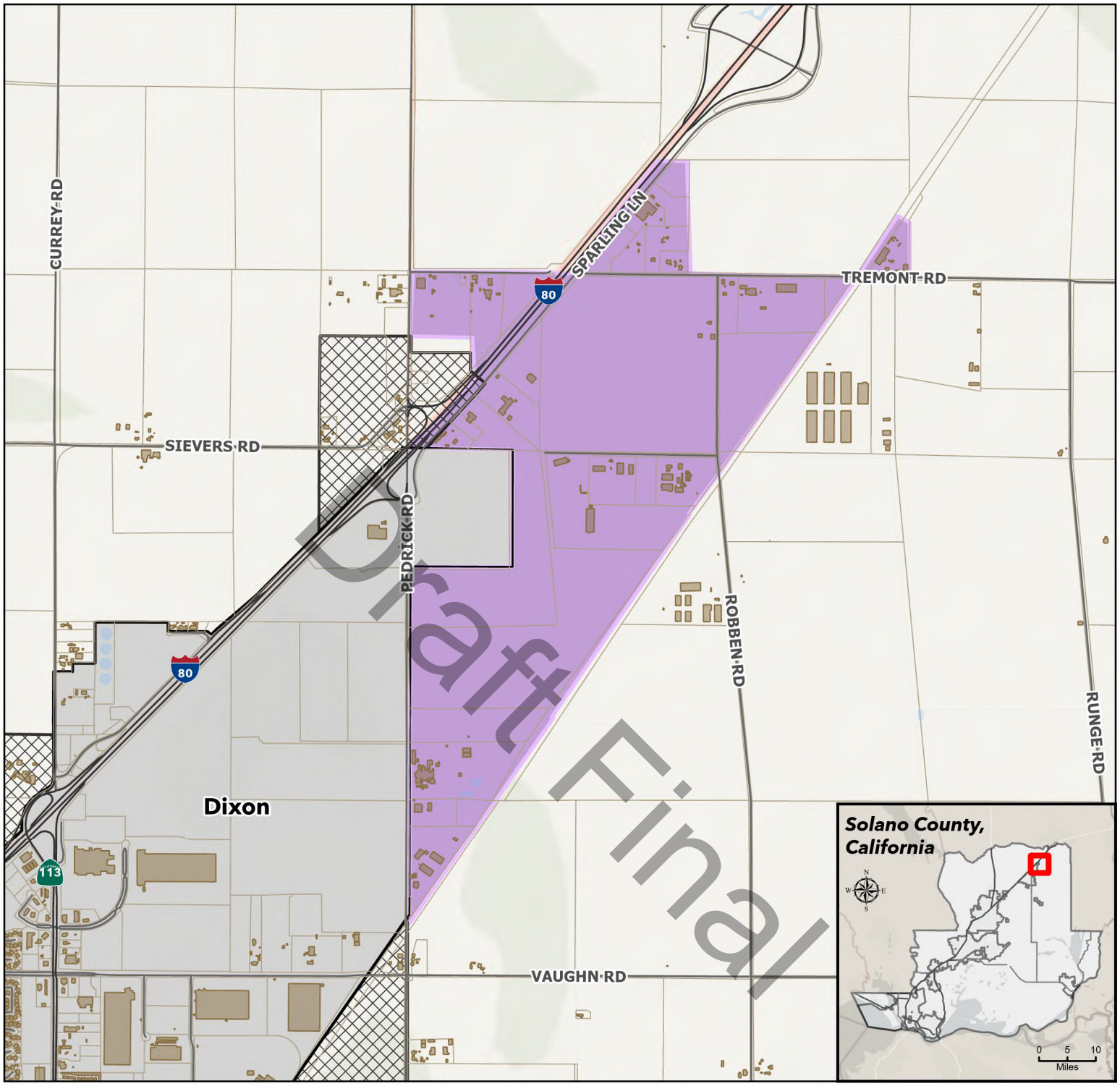

Limited Industrial Land Use Areas for Agricultural Support (Dixon Area)

Figure 2-7

Solano County Unincorporated General Plan

- Limited Industrial
- Solano County Parcels
- Building Footprints
- Dixon Sphere of Influence
- City Boundary
- Solano County Boundary

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2.2 Wastewater Management

As described in Section 1.3 and shown in Figure 1-8, there are five wastewater treatment facilities serving the incorporated cities of Solano County. In the unincorporated County, there are 11 other wastewater facilities and 18 other wastewater entities regulated by the San Francisco Bay or Central Valley RWQCBs, primarily to serve industrial facilities. These wastewater treatment facilities and entities are required to meet specific discharge monitoring and reporting requirements for the purposes of protecting groundwater and public health.

The other types of wastewater systems are the septic systems which are operated and maintained by the property owner. However, the installation, modification, repair, and decommissioning of septic systems in the unincorporated areas of the County are regulated by Solano County Environmental Health.

The challenges of managing wastewater in the unincorporated areas of Solano County are summarized and described further below:

2.2.1 Operations and Maintenance of Septic Systems

Although the General Plan acknowledges that a scarcity of community sewer facilities is "a constraint on the production of any significant quantities of new housing, especially housing constructed at densities that could be affordable to lower- and moderate-income households" (page A-35), General Plan and County Policies meant to preserve and support the agricultural economy may be limiting development by limiting wastewater management to individual septic systems serving individual parcels.

Operations and Maintenance of Septic Systems was identified as a challenge for the following Agricultural Regions:

- Green Valley
- Suisun Valley
- Pleasants/Vaca/Lagoon Valleys
- Dixon Ridge
- Elmina/Maine Prairie

It is unknown if this is a challenge for the Ryer Island, Jepson Prairie, or Montezuma Hills Agricultural Regions.

Rural Residential zoning areas are generally for low density, single-family homes, where agriculture is not the sole land use and commercial agricultural production capability is low. Solano County zoning, Section 28.31.11 states that in the rural residential areas: "Homesites are to be self-sufficient, with individual wells and individual septic systems. Water may be supplied by a public water system, operated by a public agency, in areas where water from individual wells may be of marginal quantity or quality.'

Solano County Environmental Health regulates septic systems for residential uses through Solano County code chapter 6.4. Typical are septic systems that use a tank and then gravity or pump to disperse effluent through a disposal field. Some systems require pretreatment due to limiting conditions, such as shallow groundwater, limited soil, location of surface water, or other conditions. As indicated in Section 2.1.1, ongoing monitoring of the performance of septic system is not conducted by the County, with the exception of alternative septic systems, which may be required to address site conditions (high water table, impervious soil, rock layer, etc.), limiting the ability of the County to anticipate threats to groundwater quality and human health caused by failing septic systems.

Areas unsuitable for septic systems include those that experience flooding, high groundwater levels, steep slopes, and/or impermeable soils. There are also minimum setback requirements for septic systems to protect drinking water sources, surface water, drainages, and other potential avenues of human contact. Solano County Environmental Health requires a site evaluation to be performed by a registered professional prior to the installation of a new septic system.

Operation and maintenance of a septic system is the responsibility of the landowner, who may or may not have been involved in the initial design and installation of the system. With rare exceptions, only incorporated areas are on public sewer.

Solano County zoning does not include requirements or provide similar allowances for the use of centralized wastewater treatment for higher density residences in rural residential areas with soil or groundwater conditions unsuitable for septic systems. General Plan Public Facilities and Services Policy 21 (PF.P-21) provides the following for centralized sewage systems for sewer systems which are more than serving an individual household:

In some areas, the long-term management of septic systems is further complicated by the persistent challenge of regional flooding/surface water ponding and waterway meandering encroaching on the original septic system setback distances. Section 2.3.1 will discuss challenges related to drainage and flooding in greater detail.

> "Use of such centralized sewage treatment systems shall be limited to: (1) existing developed areas, (2) areas designated for commercial or industrial uses, or (3) areas designated for rural residential development when part of a specific plan or policy plan overlay (General Plan, PF-15)."

In other words, the current County policy on allowance of centralized sewage treatment in rural areas does not consider septic system suitability.

2.2.1.1 Data Gaps

To evaluate the challenges and identify further actions to take related to operations and maintenance of septic systems, the following information is needed:

- Inventory on existing septic systems including locations, system types (standard vs engineered), maintenance records, system changes, risk/vulnerability to failure.

- Regional soil/groundwater capacity information related to septic systems, including regional feasibility evaluation to verify capacity of onsite wastewater treatment, especially for higher-density development needs.

- County-wide soil and site suitability analysis for locating septic systems.

2.2.2 Service Area Boundary Limitations

Service Area Boundary Limitations was identified as a challenge for wastewater service in the following Agricultural Regions:

- Green Valley
- Suisun Valley
- Dixon Ridge

It is unknown if this is a challenge for the Western Hills, Pleasants/Vaca/Lagoon Valleys, Winters, Elmira Maine Prairie, Ryer Island, Jepson Prairie, and Montezuma Hills Agricultural Regions.

Even in those areas where it is economically feasible and in the best interest of public health, the ability to connect to a centralized wastewater collection and treatment system is limited because of institutional barriers. The five large municipal wastewater collection systems within Solano County (City of Dixon, City of Vacaville, City of Rio Vista, Vallejo Flood and Wastewater District [VFWD], and Fairfield-Suisun Sewer District [FSSD]) are restricted to providing wastewater service to within their respective municipal boundaries. The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (CKH Act) limits the ability of cities and municipal service providers to extend their services, such as wastewater collection and treatment, to locations outside of jurisdictional boundaries or sphere of influence, especially if those areas are not contiguous.

To serve areas outside an existing wastewater treatment service boundary, one or more of the following conditions is required:

- Wastewater collection to be provided by a separate entity, such as formation of a County Service Area, and delivered to a collection system served by a treatment facility;

- Annexation of the area to a municipal service provider;

- Designation by public health office that wastewater service is required to prevent immediate human health risks; or

- Amendment to the formation legislation by state legislature.

As a result of 2019 legislation, FSSD's Enabling Act was amended to allow FSSD to serve parcels within the unincorporated Middle Green Valley Specific Plan area. The County and FSSD have executed an Agreement that wastewater collection within the area will be provided by others.

FSSD, which serves the cities of Fairfield and Suisun City, is further limited by its formation legislation (Fairfield-Suisun Sewer District Act) from serving parcels outside of Fairfield, Suisun City, or Travis Air Force Base boundaries, with limited exceptions, without an action of the State Legislature.

There are many communities that do not lie within a service area boundary of a consolidated wastewater system, including many served by SID, State Small Water Systems, the Vallejo Lakes Water System, and Rural North Vacaville Water District. A 2016 LAFCO staff report[17] identified some of these communities as unincorporated "islands", which are bounded by cities but do not receive all municipal services. There are two unincorporated wastewater service islands surrounded by the Vallejo/Benicia boundaries and nine unincorporated wastewater service islands surrounded by the FSSD boundary. Despite their proximity to consolidated wastewater infrastructure, annexation is still required prior to extending wastewater services to these areas. Figure 2-8 illustrates an example where an out-of-district service agreements were formalized between FSSD, Solano County, and LAFCO to extend FSSD sewer service just outside of FSSD boundary. The referenced agreements were intended to formalize FSSD's ability to serve properties with existing sewer infrastructure. These were not service extensions, but rather already existing sewers owned by the City of Fairfield (inherited from another special district). Because these properties fronted existing sewer infrastructure, they were eligible for service; however, this exception does not apply to parcels that do not front these existing sewers.

2.2.2.1 Data Gaps

To evaluate the challenges and identify further actions to take related to service area boundary limitations, the following information is needed:

- Inventory on failing or vulnerable septic systems.
- Map of wastewater service provider boundaries and infrastructure, spheres of influence, and planned annexations.[18]

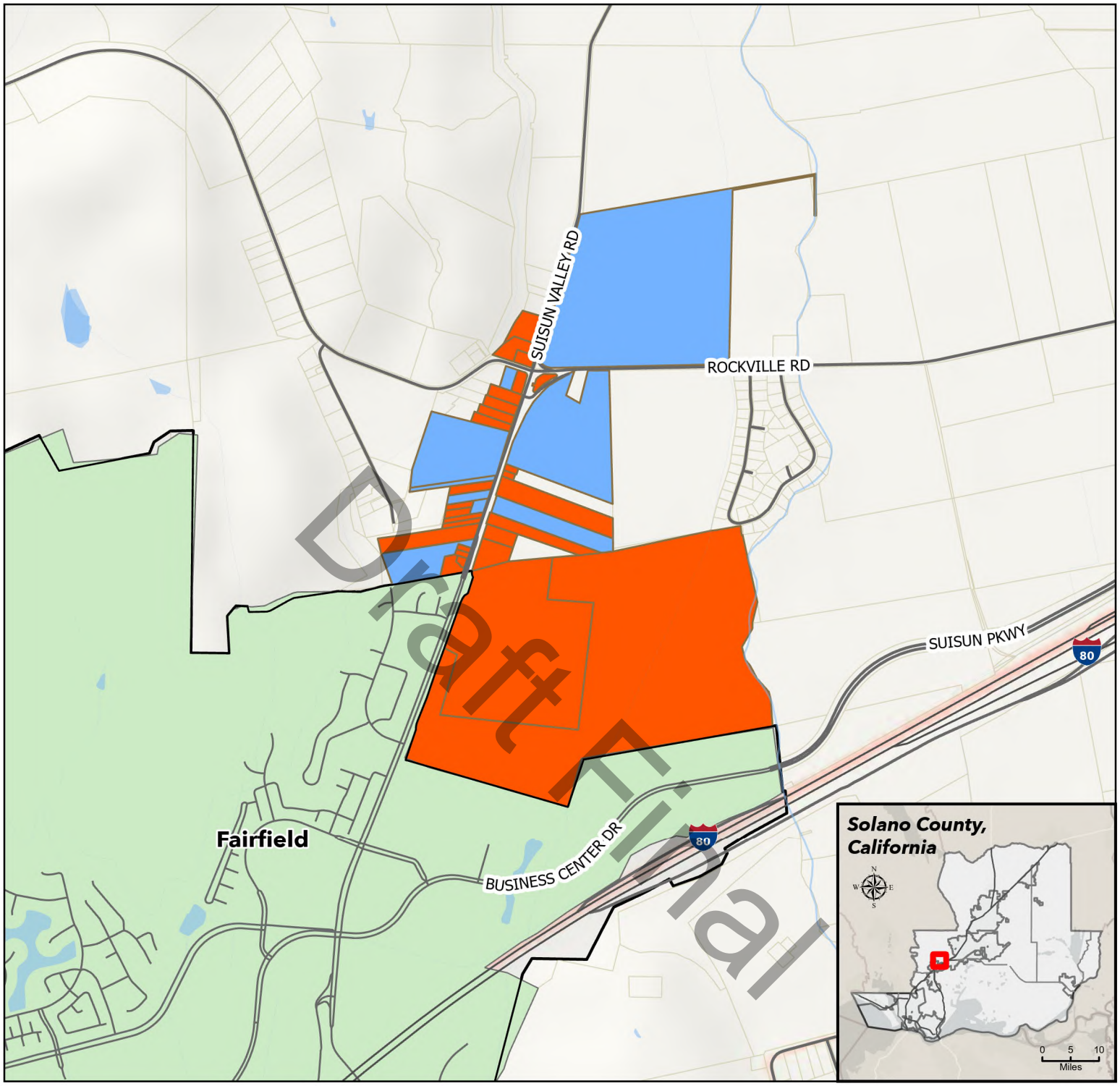
A pilot program by the Napa LAFCO established a limited exception to the CKH Act that allows the City of St. Helena to extend sewer services beyond city jurisdictional boundaries and sphere of influence for certain cases, such as:

- providing services for agricultural employee housing or mobile home park redevelopment, or
- a service deficiency was previously identified by the Municipal Service Review

The extended services must not result in growth or negatively impact open space or agricultural lands.

[17] *Solano County LAFCO Staff Report for August 8, 2016, meeting, Agenda Item 7D.*

[18] Per LAFCO's interpretation of FSSD Enabling Act, FSSD does not have its own Sphere of Influence or annexation process (unlike most wastewater districts), because the legislation directly tied FSSD boundary to city boundaries. Therefore, the Cities control the FSSD boundary by incorporating new areas. (FSSD, 2025)



Fairfield Suisun Sewer District Connections in Suisun Valley

Figure 2-8

Solano County Parcels

City Boundary

Solano County Boundary

Fairfield Suisun Sewer District (FSSD)

FSSD Consolidated Service Area

Extended Service Parcels

CONNECTED

ELIGIBLE

Disclaimer - The Fairfield Suisun Sewer District (FSSD) data is intended to provide access to public record information. The Fairfield-Suisun Sewer District makes no guarantee nor representation of any kind concerning the accuracy, completeness or suitability of any reports, information and/or data so provided. Any use of such reports, information and/or data is at the recipient's sole risk.

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2.2.3 Wastewater Services to Support Agricultural Economic Growth

As discussed in Section 2.1.3, there are land uses and areas within the County that are identified in the General Plan for development to encourage agricultural economic growth: Suisun Valley Agricultural District (ASV-20) region, ATCs shown on Figure 2-6 the Dixon Limited Industrial Land area, shown on Figure 2-7 There are currently no wastewater services in these areas, and centralized wastewater facilities may encourage development, allowing the land to be used as it is zoned.

Wastewater Services to Support Agricultural Economic Growth was identified as a challenge for the following Agricultural Regions:

- Green Valley
- Suisun Valley
- Dixon Ridge

It is unknown if this is a challenge for the Western Hills, Pleasants/Vaca/Lagoon Valleys, Winters, Elmira Maine Prairie, Ryer Island, Jepson Prairie, and Montezuma Hills Agricultural Regions.

In addition to the domestic and public health benefits of centralized wastewater systems, centralized wastewater services could also benefit agricultural land uses by freeing up the areas otherwise needed for onsite wastewater treatment, preventing groundwater impacts and promoting ag-businesses and economic growth through different types of agricultural businesses (such as greenhouses). The options available to agricultural tourism businesses or other agricultural supporting businesses are: a) obtaining a waste discharge permit from the RWQCB or County and treating onsite or b) connecting to an existing consolidated wastewater system, which may require annexation, legislative action if not located within a municipal service area boundary, or c) forming a County Service Area to serve an area.

In westside Solano County, the San Francisco RWQCB regulates Onsite Wastewater Treatment Systems for recreational vehicle wastewater and commercial/industrial users (including food processing and wineries), and winery wastewater from commercial development.

The Upper Suisun Valley and Agriculture Tourist Centers are areas where agricultural-supported businesses are likely to occur and is mostly comprised of vineyard and small-scale wine production land. The area does not currently have centralized wastewater services that are required to support a growing agricultural tourism industry. Agricultural-supported businesses typically manage process water by WDR waiver from the San Francisco Bay or Central Valley RWQCBs. Historically, wineries and other permittees with discharges of less than 1 million gallons to land annually were eligible for WDR waivers, however, Winery Order for Winery Process Water applies to flows equal or greater than 10,000 gallons per year. The Winery Order applies to flows from wineries and similar facilities for activities related to producing wine or grape juice that generate winery waste and discharge it to land for reuse or disposal. The order does not apply to wineries discharging to a community sewer nor does it apply to wastewater not associated with the winemaking process.

The North Vacaville Limited Industrial Land area is within the area identified as the Northeast Growth Area in the City of Vacaville 2017 MSR and will not be considered for annexation by the City of Vacaville until after the 5- to 10-year planning period of the most current MSR and Comprehensive Annexation Plan. Therefore, although both these areas are adjacent to municipal service areas, extension of these services, including wastewater collection and

treatment, cannot occur until and unless they are annexed. Alternatively, developments in these areas may opt for onsite treatment of wastewater under a WDR permit or waiver.

2.2.3.1 Data Gaps

To evaluate the challenges and identify further actions to take related to wastewater services to support agricultural economic development, the following information is needed:

- Service Area Mapping: Map of wastewater service provider boundaries and infrastructure, spheres of influence, and planned annexations and the unincorporated County lands with the ASV-20, ATC, and limited Industrial zoning.
- Extension Requirements: Agreements, funding mechanisms, studies, and permits necessary to extend existing consolidated wastewater collection services or to accept material from agricultural processors/producers.
- Service Limitations: Constraints on providing consolidated wastewater services to businesses.
- Winery Wastewater**:** Quantification of wineries using onsite wastewater disposal, including disposal methods, total volumes of wastewater disposed, and potential options or alternatives.

2.2.4 Recycled Water Delivery

While the technology to generate and use recycled water has made it a common water conservation strategy, taking advantage of this resource is difficult in areas such as Solano County, which lacks recycled water delivery infrastructure and generally has access to ample supplies of groundwater and surface water. Successful recycled water programs in California, such as those implemented by Eastern Municipal Water District (EMWD) and the Los Angeles County Sanitation Districts (LACSD), were able to set recycled water user rates lower than the cost to purchase or produce potable water from sources such as groundwater from an adjudicated basin or water imported through a wholesaler[19].

Recycled Water Delivery for available supply was identified as a challenge for the following Agricultural Regions:

- Green Valley
- Suisun Valley
- Dixon Ridge
- Elmira/Maine Prairie

There are no centralized wastewater treatment facilities for recycled water supply in the Pleasants/Vaca/Lagoon Valleys, Winters, Ryer Island, Jepson Prairie, and Montezuma Hills Agricultural Regions.

Some agricultural producers directly adjacent to the FSSD wastewater treatment plant (WWTP) have expressed interest in using treated recycled water for crops and supplementing water for habitat and duck clubs, which currently rely on seasonal flooding. FSSD has historically provided recycled water for agricultural, and nursery crops adjacent to the wastewater treatment plant. However, even when there is interest in using

[19] WateReuse, "Access to Safe & Affordable Water: The Case for Investment in Water Reuse, the Once and Future Solution." Accessed 10 April 2024. <https://watereuse.org/wp-content/uploads/2021/10/Policy-Brief-Affordability.pdf>

recycled water, there is reluctance by users to invest in new pipeline, pump station, and storage infrastructure to convey the recycled water to the place of demand when there are nearby sources of water that can be obtained at lower cost, such as on-site groundwater wells or existing canals/pipelines.

Recycled water also is not always accepted by growers or consumers. While recycled water for agricultural use is common in many areas of California such as the Salinas Valley, grower education regarding water quality including salinity, boron and other parameters and crop compatibility is needed as well as regulations for recycled water use. Recycled water production and use is regulated by the State Water Resources Control Board through the California Code of Regulations Title 22.

2.2.4.1 Data Gaps

To evaluate the challenges and identify further actions to take related to recycled water, the following information is needed:

- Map of wastewater service provider discharge water quality, treatment, and locations and nearby infrastructure/drainages.
- Information and locations for existing and potential agricultural/industrial recycled water users, crop types, and barriers to implement or utilize recycled water.

Treatment of wastewater produces two waste streams: (1) biosolids and (2) effluent water. Depending on the level of processing, both biosolids and effluent water (recycled water) can be applied beneficially to land as either soil amendments or irrigation water-Treating both waste streams to meet the requirements for land application could be a strategy to meet lower discharge nutrient limits while also producing a product that could be sold to recover the costs of increased treatment.

2.2.5 Updated Nitrogen Regulation

For the westside of Solano County, the San Francisco Bay RWQCB regulates nutrient discharge via the Nutrient Watershed Permit (Order No. R2-2024-0013), which requires wastewater treatment plants:[20]:

Measure and report the amount of nutrients they discharge to the San Francisco Bay.

Nitrogen Regulation was identified as a challenge for wastewater treatment facilities in the following Agricultural Regions:

- Green Valley
- Suisun Valley

Provide financial support to a Nutrient Management Strategy (NMS) Science Program to understand the impacts of nutrients on the San Francisco Bay water quality; and,

Investigate alternatives for reducing nutrients in wastewater discharge.

The most recent Nutrient Watershed Permit (NWP) was adopted on 10 July 2024 and is effective on 1 October 2024. The NWP regulates the load of Total Inorganic Nitrogen (TIN) that

[20] Bay Area Clean Water Agencies. "Nutrients in San Francisco Bay Region Wastewater." Accessed 10 April 2024. <https://bacwa.org/wp-content/uploads/2023/01/BACWA-Nutrient-Fact-Sheet.pdf>

municipal treatment plants can discharge during the dry season (May 1 through September 30). The NWP provides an interim limit beginning in the 2025 dry season, with a final limit that goes into effect for the 2035 dry season and requires, on average, a 40% reduction over current discharges. Due to the new regulations, municipal wastewater treatment agencies in westside Solano County will need to carefully evaluate any new dischargers for their nitrogen contributions to ensure compliance with the NWP. Such wastes could be those generated by wineries and food processors, restaurants, and other similar facilities.

In 2025, FSSD commence construction of treatment plant upgrades that will support compliance with the 2035 final TIN limit, adding a denitrification process to the treatment plant. A second phase of upgrades will be required to achieve consistent compliance with the 2035 limits.

The NWP update may impact the ability of wastewater treatment plants to accept and process waste streams, especially if nutrient contributions are high, from prospective agricultural and industrial processors. For example, FSSD does not anticipate expanding its acceptance of high-strength waste services due to the nitrogen limits for effluent discharge. For growers and other producers of high-strength wastewater without onsite treatment in Solano County, the alternative is shipping wastewater out of the County to accepting facilities such as East Bay Municipal Utilities District (EBMUD) in Contra Costa County or another facility that may be better able to comply with the future nutrient limits.

2.2.5.1 Biosolids from Wastewater Treatment Plants

Another waste stream for wastewater treatment plants and industrial processors are biosolids, which are the solid fraction of sewage sludge that undergoes treatment to reduce pathogens and reduce vector attraction factors. An opportunity for agricultural lands is the use of “cleaned” biosolids are used by many agricultural businesses to amend their soils. The Solano County Department of Resource Management Biosolids Landspreading Program established requirements through Solano County Code Chapter 25, classifying biosolids based on pathogen reduction requirements of section 503.32(a) and (b) of Title 40, Code of Federal Regulations. According to the 2023 Solano County Biosolids Report 495 acres of farmland received 2,613 calculated dry tons of Class B biosolids as soil amendments and the previous five years of land application averaged 7,109 calculated dry tons per year.

In addition, Canadian-based Lystek International Inc. (“Lystek”) operates its Organic Material Recovery Center in partnership with FSSD to produce a liquid fertilizer which is classified as “Class A Land Application” under U.S. EPA 40 CFR Part 503, and can be applied to land with limited restrictions. According to the 2023 Solano County Biosolids Report, 13 San Francisco Bay Area wastewater agencies (including FSSD, the City of Benicia, and Vallejo Flood & Wastewater District) and one industrial generator sent their biosolids to the Organic Material Recovery Center, representing 6% of the total end use of biosolids material in the San Francisco Bay Area. The management and processing of biosolids in Solano County, and any expansion of such processes may also need to be adapted to comply with the anticipated lowered nutrient limits of the 2024 Nutrient Watershed Permit update.

2.2.5.2 Data Gaps

To evaluate the challenges and identify further actions to take related to nitrogen regulation, the following information is needed:

- Requirements and barriers for current and future processors/producers to treat high strength wastes onsite vs offsite hauling/treatment.
- Coordinated understanding of what incorporated parcels would benefit from municipal sewer service, what land uses those parcels might have, and governmental/financial strategies for providing such service.
- Coordinated planning with municipal wastewater agencies to understand the implications of expanding service areas.

Uncoordinated Drainage/Flood Management Responsibilities was identified as a challenge for the following Agricultural Regions:

- Green Valley
- Suisun Valley
- Dixon Ridge
- Elmina/Maine Prairie
- Ryer Island
- Jepson Prairie

It is unknown if this is a challenge for the Montezuma Hills Agricultural Region.

2.3 Drainage and Flood Management

As described in Section 1.4 and shown in Figure 1-9, Solano County is home to both state and local flood control and drainage projects, overseen by multiple jurisdictions. In addition, flooding and lack of flood and drainage infrastructure has resulted not only in property damage but also in crop loss and scour of fields in agricultural areas in the County. This section discusses the challenges to operate and maintain facilities that serve multiple purposes including flood control and drainage as well as water conveyance in some cases.

Based on input from Steering Committee members, flood control and drainage challenges are in the areas of uncoordinated drainage/flood management responsibilities, inadequate flood infrastructure capacity, outdated studies on drainage/flooding, and groundwater recharge suitability. A key barrier to advancing drainage and flood management improvements is the lack of sustainable and coordinated funding, as current financing mechanisms often require multi-jurisdictional collaboration and voter-approved initiative that are difficult to achieve.

2.3.1 Clarity on Coordinated Drainage/Flood Management Responsibilities

As presented in Section 1.4, the following have explicit responsibility or authority related to flood control and/or drainage:

- Cities within Solano County,
- Solano County Water Agency,
- Solano County,
- Solano Irrigation District,

- 24 reclamation districts,
- two of the three resource conservation districts, Dixon RCD and Suisun RCD,
- other Local Maintaining Agencies (See Section 1.4.7),
- State and Federal agencies that maintain and operated Yolo Bypass and some Delta levees; and
- Private land-owners adjacent to natural creeks and drainages are responsible for drainage maintenance on their own property.

In addition, FSSD has programmatic regulatory compliance oversight of the Solano Stormwater Alliance, comprising Fairfield, Suisun City, Vallejo, and Vallejo Flood & Wastewater District for water quality compliance under the Municipal Regional Stormwater NPDES permit, Order No R2-2022-0018. The individual agencies are infrastructure owners, but FSSD provides regulatory compliance services and coordination across jurisdictions.

The resulting patchwork of responsibilities has led to:

- Lack of regionwide sponsors and oversight for flood control infrastructure, management, and maintenance.
- Lack of infrastructure for retaining flood waters (particularly in low density rural areas)
- Lack of coordination how projects in one jurisdiction may impact downstream jurisdictions.
- Difficulty in funding improvements due to the complexities of stormwater infrastructure financing, which often requires coordination among multiple jurisdictions and public approval through voter-approved initiatives.

Furthermore, the California Department of Transportation (CalTrans) is responsible for the maintenance of Interstate 80, which has been experiencing flooding in and around the Fairfield-Suisun area. The California Department of Transportation is exploring installing detention basins along the freeway to reduce closures due to flooding. However, these areas are also prime agricultural lands and development of new detention basins and retention ponds may conflict with existing agriculture uses. Any changes to lands need to be coordinated and aligned with existing and long-term land uses, especially changes that could: (1) take agricultural land out of production or result in increased flooding and (2) cause levee overtopping and damage to adjacent lands.

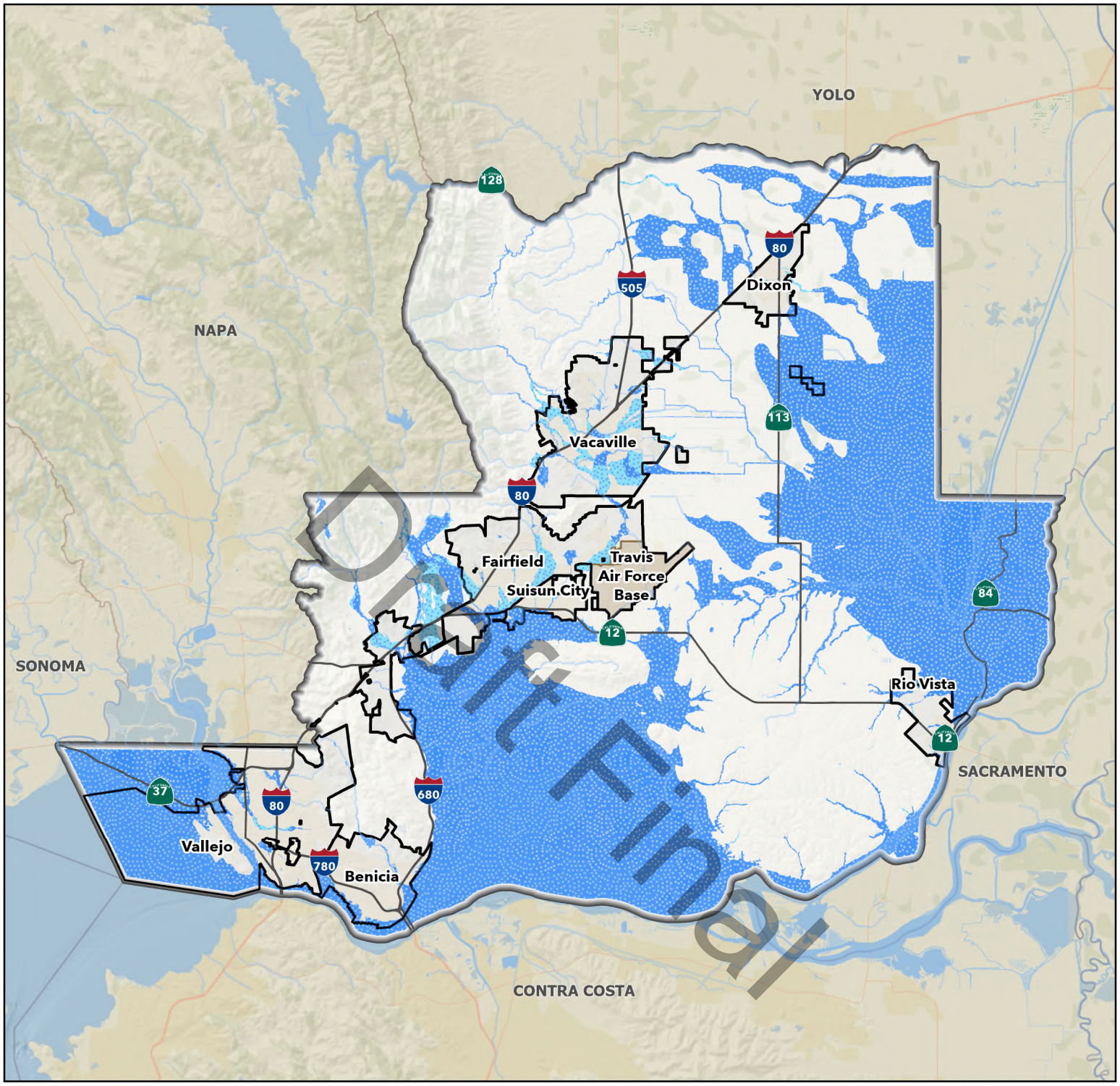
The Suisun RCD holds a General Permit for wetlands maintenance. Landowners represented by the Suisun RCD, California Department of Fish and Wildlife, Department of Water Resources, and the US Bureau of Reclamation can apply through the Suisun RCD to work in areas subject to the US Army Corps of Engineers within the Suisun Marsh (https://suisunrcd.org/permits/#regionalgeneral). This General Permit may be a model for developing a streamlined permit for creek cleaning throughout the County.

Local Creeks: Inconsistent flood/drainage responsibilities/authority also impacts creek cleaning and maintenance. There are many local creeks that contribute to flooding in the County, including: American Canyon Creek, Suisun Creek, Green Valley Creek, Dan Wilson Creek, and Ledgewood Creek. The creeks are managed by a mix of private owners and public entities. No single entity can undertake creek cleaning with independent authority. The myriad of permits that may be needed prior to creek cleaning, is complicated and greatly discourages public agencies[21] and private landowners to undertake cleaning activities. The potential inaction from not obtaining the right permits could lead to a loss of conveyance capacity of natural drainages from a buildup of heavy vegetation and siltation. Excess debris in creeks and drainages, as well as changes to upstream land conditions, can result in flooding and impacts to downstream lands and infrastructure.

The Tremont 3 watershed in the Dixon Agricultural Area is anticipated to develop and may contribute additional runoff into strained downstream facilities. Drainage from this area eventually flows into RD 2018. facilities and then to Haas Slough.

Regional Considerations in Flooding: The lack of a regionwide flood authority, land development that increases runoff, and inadequate capacity in existing drainage facilities are all challenges for the drainage and flood managers, particularly on the eastside of the County in the Dixon and Elmira Maine Prairie Agricultural Areas, which receive flows from the Western Hills and Winters Agricultural Areas, as well as from the Yolo Bypass. As shown in Figure 2-9 and Figure 1-4, the Suisun Marsh and a significant portion of the Elmira Maine Prairie and Ryer Island Agricultural Areas are within the 100-year floodplain, and high tide, sea level rise and elevated water levels in the Yolo Bypass make it likely that water will back up these areas and result in longer duration of flooding. Reclamation District 2068 (RD 2068) receives runoff from the eastern portion of Solano County that includes the Maine Prairie Water District, and according to RD 2068, lands adjacent to the Yolo Bypass experience flooding when the water level in the Yolo Bypass is elevated and does not have further capacity to absorb stormwater flows from the upper watershed.

[21] FSSD has recent experience attempting to clean vegetation from a manmade, constructed stormwater detention basin, which the regulatory agencies are considering a wetlands habitat and thereby preventing the maintenance that is critical to maintaining capacity and eliminating fire danger (from overgown vegetation in the summer) (FSSD, 2025).



100 and 500 Year Floodplain Mapping

FEMA 100-Year Floodplains

FEMA 500-Year Floodplains

Travis Air Force Base

City Boundary

Solano County Boundary

Figure 2-9

Source: California Department of Water Resources - https://gis.bam.water.ca.gov/bam/; https://services.gis.ca.gov/arcgis/rest/services/InlandWaters/Flood_Risk_State/MapServer

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2.3.1.1 Data Gaps

To evaluate the challenges and identify further actions to take related to uncoordinated flooding/drainage responsibilities, the following information is needed:

- Documentation and mapping of agencies with flood control and drainage responsibilities.
- Compiled mapping (e.g. location, size, original capacity, purpose, material type etc.) of infrastructure used for flood/drainage management.
- Documentation and mapping of property owners along creeks and drainages.
- Documentation and mapping of flood events/impacts including location/extent of flooding, date and duration, cause, impacts, and mitigation/recovery costs.
- Hydrologic and hydraulic modeling on a larger geographic scale
- Strategies needed to support multi-jurisdictional funding for planning, design, permitting, and implementation of stormwater, flood and drainage improvements as most agencies are under resourced for this challenge.

2.3.2 Outdated Studies on Drainages/Flooding

Outdated Studies on Drainages/Flooding was identified as a challenge for the following Agricultural Regions:

- Green Valley
- Suisun Valley
- Pleasants/Vaca/Lagoon Valley
- Winters
- Dixon Ridge
- Elmina/Maine Prairie
- Ryer Island
- Jepson Prairie

It is unknown if this is a challenge for the Montezuma Hills Agricultural Region.

It has been six decades since the construction of the Green Valley and Ulatis Flood Control Projects. The Dixon RCD facilities were first constructed in 1950s and 1960s . Since then, as captured in the 2020 SCWA Lower Cordelia Floodplain Reconnaissance Study, development, urbanization, changes in grazing practices and land use changes have altered historical runoff and increased deposition of sediments into conveyance channels. A number of models and studies have been completed to understand drainage and flooding (and changes over time) to identify management activities in Solano County, including:

- May 1998 – Solano County Water Agency, Flood Control Master Plan Phase I and Phase II and hydrologic/hydraulic model update of the Ulatis Flood Control Project: Phase I analyzed flood and drainage infrastructure and institutional challenges throughout the County. Phase II classified flood problems based on 1) local problems (such as plugged or inadequate culverts) and 2) problem areas (problems requiring coordination among landowners or agencies to address). Phase II also recommended creeks/areas for further management plan

development and flood control activities such as data collection, model updates, and updating the County Hydrology Manual.[22]

- 24 August 2001 to current – Dixon Watershed Management Plan (DWMP) and hydrologic/hydraulic model of the Dixon RCD drains: The Dixon Watershed Management Plan is being updated through a joint effort to explore and implement drainage improvement projects by the Dixon Regional Watershed Joint Powers Authority (JPA) made up of the Dixon RCD, RD2068, Maine Prairie Water District, and the City of Dixon. Phase 1 was completed in 2019 and describes the drainage issues in and around the Dixon Agricultural Area. Phase 2 of the Plan will explore potential MAR locations and identify future studies and activities to fill data gaps.[23]

RD2068 staff reported during a Steering Committee meeting that the District has seen some relief from drainage issues as the City of Dixon has put in retention ponds; but the feasibility of additional retention ponds in or owned by the City of Dixon is unclear. Retention of drainage waters in the Dixon and Elmira Maine Prairie Agricultural Areas is sorely lacking but can make a big difference to RD2068 if they are located appropriately upstream. A regional plan has been in discussion for over 20 years but never completed.

- 20 February 2020 – Solano County Water Agency, Lower Cordelia Floodplain Reconnaissance Study: This study evaluates the potential source and range of flood impacts due to development, hydromodification, tidal influences, sedimentation, streamflow, local runoff, and sea-level rise. This study identified streamflow and tidal influences as contributing the flooding by taking up the local runoff conveyance capacity of the Green Valley Flood Control Project and called for dredging of the Green Valley Flood Control Project, increased maintenance to manage sedimentation, and strategic restoration of managed wetlands to tidal wetlands to adapt to rising sea levels.[24]

- December 2020 – Solano County Water Agency, Ulatis System Post-Fire Flooding Assessment and hydrologic/hydraulic model of the Ulatis System creeks: This study utilized hydrologic modeling to examined post-2020 Hennessey Fire peak flows in the Ulatis System and the impacts to the City of Vacaville and surrounding areas. The results of the modeling were used to develop a suite of recommendations that includes monitoring and maintaining drainage infrastructure, monitoring channel conveyance capacity at high-risk locations, and evaluating ecosystem recovery.[25]

[22] Solano County Water Agency. Flood Control Master Plan Phase II. West Yost & Associates Consulting Engineers, May 1998. https://scwa2.com/flood-control/flood-control-master-plan-phase-ii/

[23] Solano County Water Agency. Technical Memorandum Subject: Addendum to the Dixon Watershed Management Plan, Updating the Tremont 3 Watershed Regional Drainage Project. West Yost & Associates Consulting Engineers. 27 June 2019.

[24] Solano County Water Agency. Lower Cordelia Floodplain Reconnaissance Study Final Report. cbec eco engineering. 20 February 2020. https://scwa2.com/wp-content/uploads/2020/12/F-31.Lower-Cordelia-Report.Feb-2020-ID-262432.pdf

[25] Solano County Water Agency. Ulatis System Post-Fire Flooding Assessment. cbec eco engineering. December 2020.

- Planning studies and modeling are needed to understand the current sources of runoff, sedimentation, flooding, and future impacts due to climate change. As indicated in the proposed updated DWMP analysis, MAR could be used as a strategy to manage flooding and excess drainage. Hydrologic modeling or updates to existing models along with soil/site evaluations at the local and regional scale are needed to identify and evaluate suitable locations for MAR activities including changes in land management practices, retention basins or injection wells that could be effective in reducing the impacts to flooding. However, updating these studies and performing models presents challenges since the local creeks and streams are described as "flashy", lack gaging data and are difficult to model, including Pleasants Creek, Sweeny Creek, American Canyon Creek, Suisun Creek, Green Valley Creek, Dan Wilson Creek (within the City of Fairfield), and Ledgewood Creek (draining into the Suisun Marsh). Furthermore, model and data updates will need to consider climate change, including redefining the 100-year floodplain, new developments and land use changes, climate variability/change, and new/changed infrastructure and operations.

2.3.2.1 Data Gaps

To evaluate the challenges and identify further actions to take related to outdated studies on flooding/drainages, the following information is needed:

- Documentation and mapping of flood events/impacts including location/extent of flooding, date and duration, cause, impacts, and mitigation/recovery costs.
- Compiled mapping (e.g. location, size, original capacity, purpose, material type etc.) of infrastructure used for flood/drainage management.
- Condition assessment/performance evaluation of existing drainage/flood infrastructure.
- GIS/modeling of non-federal/non-State flood control/drainage infrastructure including model calibration information such as gaging stations to monitor stream flow, current channel configuration, and studies to confirm actual land characteristics.
- Documentation and mapping of property owners along creeks and drainages.
- Monitoring of runoff flows to characterize changing flow volumes and patterns due to extreme events and other climate change impacts.[26]
- Flood control and management infrastructure design update based on climate change impacts.

[26] As of 2025, Dixon RCD and RD 2068, with the assistance of SCWA have installed flow measurements stations in their stations (Dixon RCD, 2025)

2.3.3 Groundwater Recharge Suitability

Groundwater Recharge Suitability was identified as a challenge for the following Agricultural Regions:

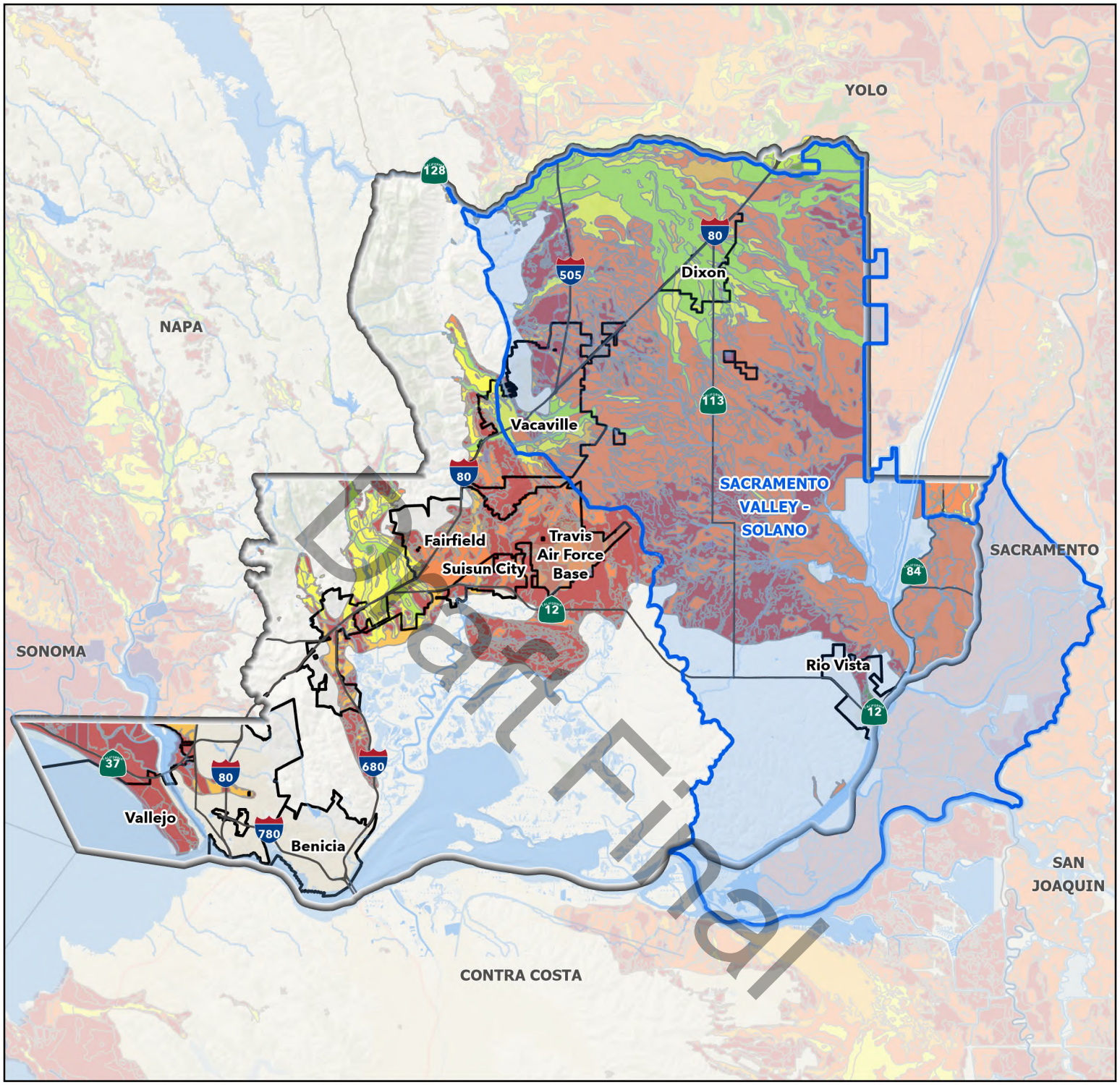
- Green Valley
- Suisun Valley
- Winters
- Dixon Ridge
- Elmira/Maine Prairie
- Ryer Island
- Jepson Prairie

It is unknown if this is a challenge for the Montezuma Hills Agricultural Region.

Managed aquifer recharge (MAR) via changes in land practices, retention basins and/or injection wells to facilitate percolation of excess water can be methods of disposing excess runoff in areas with suitable hydrogeologic conditions. The Soil Agricultural Groundwater Banking Index (SAGBI) is a suitability index that was developed for effective groundwater recharge on agricultural land. The SAGBI is based on five critical factors including deep percolation, root zone residence time, topography, chemical limitations, and soil surface condition. As shown in Figure 2-10, the potential areas with good recharge ratings based on the SAGBI are within the eastern side of the County, near the City of Dixon and the Northwest Focus Area. However, MAR requires access to large land areas, and the permeable soils best suited for recharge often overlap with IPrime Farmland. Inundation of these lands could damage crops in production. At the same time, MAR can also provide other important benefits: retention basins may protect surrounding agricultural lands and infrastructure, and create buffers between agricultural and non-agricultural uses. Therefore, the siting and installation of MAR facilities to manage excess flows requires close coordination with landowners to identify opportunities where benefits outweigh the potential impacts, such as changes to surface characteristics or the temporary or permanent removal of land from production, depending on the land use.

The Suisun Valley is part of the Fairfield-Suisun Valley Basin (USGS https://data.cnra.ca.gov/dataset/bbd2/resource/8a156704-8fbd-4eeb-aaa1-fa5cbc555ed3) which is not required to be managed under SGMA. Therefore, limited information is available about the groundwater resources and aquifer health in the basin. As presented in Section 2.1.1, groundwater levels in and around the Suisun Marsh are relatively shallow (less than 30 feet to groundwater). Therefore, it is unclear whether groundwater recharge would be effective and beneficial since there is less capacity for accepting excess drainage as recharge.

MAR strategies to address flooding are being explored by the Solano GSP. The GSP is estimating the potential stormwater benefits from using MAR on agricultural fields in flood-prone areas in and around the Northwest Focus Area of the Solano Subbasin.



Potential Areas for Recharge

(SAGBI Unmodified)

Suitability Score

- 85 - 100 Excellent
- 69 - 85 Good
- 49 - 69 Moderately Good
- 29 - 49 Moderately Poor
- 15 - 29 Poor
- 0 - 15 Very Poor
- SACRAMENTO VALLEY - SOLANO Subbasin
- Travis Air Force Base
- City Boundary
- Solano County Boundary

Data Source: The Soil Agricultural Groundwater Banking Index (SAGBI) is a suitability index for groundwater recharge on agricultural land. The SAGBI is based on five major factors that are critical to successful agricultural groundwater banking: deep percolation, root zone residence time, topography, chemical limitations, and soil surface condition):https://casoilresource.lawr.ucdavis.edu/sagbi</
O'Geen A, Saal M, Dahlke H, Doll D, Elkins R, Fulton A, Fogg G, Harter T, Hopmans J, Ingels C, Niederholzer F, Sandoval Solis S, Verdegaal P, Walkinshaw M. 2015.

Soil suitability index identifies potential areas for groundwater banking on agricultural lands (Article)
by A.T. O'Geen, Matthew B.B. Saal, Helen Dahlke, David Doll, Rachel Elkins, Allan Fulton, Graham Fogg, Thomas Harter, Jan W. Hopmans, Chuck Ingels, Franz Niederholzer, Samuel Sandoval Solis, Paul Verdegaal and Mike Walkinshaw:https://californiaagriculture.org/article/108868 California Agriculture Vol. 69(2):75-84. April 01, 2015

Figure 2-10

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In addition to soil suitability for MAR, it is unknown whether facilitating groundwater recharge of excess flood and drainage water could have negative impacts on groundwater quality, especially if agricultural lands were to be used for recharge. A 2020 study[28] of the risk of MAR to exacerbate the leaching of nitrates and salts into the groundwater basin found that historic land use, current nitrogen management, soil permeability class and current crops were all factors in the amount of nitrate that could leach below the root zone and enter the groundwater supply.

The outreach results also identified a need for future studies to examine the effects of land use history, climate, land management practices, and irrigation systems on nitrate leaching through MAR.

2.3.3.1 Data Gaps

To evaluate the challenges and identify further actions to take related to groundwater recharge suitability, the following information is needed:

- Landowners interested in participating in MAR.
- Crops that can tolerate or benefit from long durations of standing water.
- Field data for recharge rate of soils and areas for recharge.
- Long-term data to support characterization of Suisun-Fairfield Valley Basin, including groundwater levels, storage capacity, groundwater quality, pumping volumes, and sources and rates of infiltration/recharge.
- Studies examining the effects of land use history, climate, land management practices, and irrigation systems on nitrate leaching through MAR.

2.4 Agricultural Area Summary

The following is a summary of the key challenges in Solano County related to water supply, wastewater management, and flood control.

Water Supply and Conveyance

- **Groundwater Quality and Supply:** The county relies on groundwater in areas lacking access to surface water sources. However, quality issues such as arsenic, hexavalent chromium, and nitrate contamination are prevalent in some areas, with small water systems often struggling to comply with water standards. Contamination of domestic wells by failing septic systems may also be a potential issue.

[28] Waterhouse H, Bachand S, Mountjoy D, Choperena J, Bachand P, Dahlke H, Horwath W. 2020. Agricultural managed aquifer recharge — water quality factors to consider. Calif Agr 74(3):144-154. https://doi.org/10.3733/ca.2020a0020.

- **Declining Groundwater Levels:** Areas like Western Hills and Dixon Ridge (i.e., Northwest Focus Area) experience groundwater declines affecting agricultural and domestic supply.

- **Small Water Systems:** Small and State Small water systems, with limited customer bases, often struggle with maintenance costs and compliance with primary drinking water standards.

- **Adequacy for Agricultural Development:** The County has agricultural industrial zones that could benefit from expanded water infrastructure to support economic activities, yet infrastructure limitations would result in individual private wells as the primary alternative.

Wastewater Management

- **Septic System Challenges:** Many rural areas depend on septic systems due to zoning regulations, but poor maintenance and limited county oversight on system performance threaten groundwater quality.

- **Service Boundary Restrictions:** Extension of municipal wastewater services to unincorporated areas is restricted, and alternative solutions are complex and expensive.

- **Support for Agricultural Development:** Expanding wastewater services to agricultural zones would support local economic activities but faces institutional and regulatory challenges.

- **Recycled Water Delivery:** Limited infrastructure for recycled water hampers water conservation, even though recycled water could supplement agricultural water supplies.

- **Updated Nitrogen Regulations:** New nutrient discharge rules may restrict wastewater facilities from processing high-strength wastes, impacting local processors who may need to transport waste out of the county.

Flood and Drainage Management

- **Uncoordinated Responsibilities:** A mix of local, state, and private agencies share flood management, creating gaps in responsibility, which complicates coordinated flood prevention efforts.

- **Outdated Infrastructure and Studies:** Flood management infrastructure is aging, and some areas lack up-to-date studies on flood risks, especially the impacts of climate change and as development increases runoff.

- **Inadequate Flood Control Infrastructure:** Low-capacity drainage facilities, especially on the County's Eastside, face challenges in handling increased stormwater, exacerbated by the risk of sea-level rise in Bayshore areas.

- **Groundwater Recharge Suitability:** MAR enhances groundwater percolation but often conflicts with Prime Farmland, risking crop damage and requiring landowner coordination. It can also alter land characteristics, impacting agriculture.

The challenges in the various Agricultural Areas are shown in detail in Table 2-4, which highlight the need for improved infrastructure, coordination among agencies, and additional funding to support both agricultural and residential needs in Solano County.

Table 2-4: Likely Applicability of One Water Challenges to Agricultural Areas

Challenge	Agricultural Region									
	Western Hills	Green Valley	Suisun Valley	Pleasants/ Vaca/ Lagoon Valleys	Winters	Dixon Ridge	Elmira/Maine Prairie	Ryer Island	Jepson Prairie	Montezuma Hills
Water Supply and Conveyance										
Potential Contamination of Domestic Wells by Septic Systems	x	x	x	x		x	x	u	u	u
Poor Groundwater Quality	x	x	x	x	x	x	x	x	x	x
Declining Groundwater Levels to Meet Demands	x			x	x	x				
Lack of Drinking Water Supply (SWS)	x	x	x	x			u	u	u	u
Limited Rate Payer Base (SWS)	x	x	x	x	u	u	u	u	u	x
Meeting Water Quality Regulations (SWS)	x	u	u	x	u	x	u	x	u	x
Water Supply to Support Agricultural Economic Growth			x			x				
Management of Wastewater										
Operations and Maintenance of Septic Systems	u	u	u	u	u	u	u	u	u	u
Service Area Boundary Limitations	u	x	x	u	u	x	u	u	u	u
Wastewater Services to Support Agricultural Economic Growth	u	x	x	u	u	x	u	u	u	u
Recycled Water Delivery		x	x	u	u	x	x	u	u	u
Updated Nitrogen Regulation		x	x							
Drainage and Flood Management										
Uncoordinated Drainage/Flood Management Responsibilities		x	x			x[1]	x	x	x	u
Groundwater Recharge Suitability		u	u		x	x	x	x	x	u
Outdated Studies on Drainages/Flooding		x	X	x	x	x	x	x	x	u

u: This challenge was not identified for this Agricultural Area, but future investigations may confirm whether this challenge is applicable.

[1] The Dixon Regional Watershed Joint Powers Authority (whose member agencies include City of Dixon, Dixon RCD, Maine Prairie Water District and RD 2068) provides ongoing ag/urban coordination through managed and shared drainage facilities in much of the Dixon Ridge Agricultural Region. (Dixon RCD, 2025)

Based on the above table, the top five Agricultural Areas that have the most identified water challenges are: Green Valley, Suisun Valley, Pleasants/Vaca/Lagoon Valleys, Dixon Ridge, and Elmira/Maine Prairie. The findings emphasize that data collection and regional collaboration are critical next steps in addressing these issues effectively. The data gaps identified in this section are used as a basis to develop the overall general implementation actions needed to support the Solano County Utilities Master Pan as described in Section 5.

However, in Section 4 specific actions are presented for three selected projects to address the identified or priority challenges in certain Agricultural Areas as examples to showcase the One Water resources planning process.

Section 3: The Integration of One Water Framework Goals for Water Resources Management

The One Water goals and the associated strategies outlined in this section were developed based on the regional challenges identified by the Steering Committee as described in Section 2. The goals and strategies are also in alignment with the Solano County General Plan Update Vision and Guiding Principles. They provide a roadmap to the development and implementation of the water resources component of the Solano County Utilities Master Plan.

As such, the One Water Goals were developed iteratively based on feedback from the Steering Committee with the aim of supporting the implementation of the General Plan with considerations for the Orderly Growth Initiative and the County's natural resources and economy.

3.1 One Water Goals and Strategies

Based on the challenges and information gaps identified in Section 2, goals and strategies are developed to address the region's most pressing needs. The Solano One Water Framework uses goals (broad statements of purpose) and strategies (courses of action to achieve goals) to address challenges and information gaps, guiding the development of a water resources component in the Solano County Utilities Master Plan. The following outlines how these components are structure within the Framework:

- **Goals**: The One Water Framework establishes holistic goals that integrate all available water resources. These goals provide a roadmap for the future Solano County Utilities Master Plan. Examples include increasing water supply, improving wastewater management, and enhancing climate resilience.
- **Strategies**: Strategies are long-term actions designated to achieve the goals of the One Water approach. They involve various approaches, including:
    - Continuing to engage and collaborate with water partners
    - Developing new agreements and venues for collaboration to address specific geographies/issues
    - Mining existing data sources to progress to filling data gaps.
- **Actions**: In Section 4(Implementation Strategy) includes specific implementation actions to achieve the goals and strategies and address the challenges, contributing to the development of the water resources component of the Solano County Utilities Master Plan. These actions are designed to address challenges identified by stakeholders and may include:
    - Developing a Countywide Drainage Study and Analysis
    - Characterizing groundwater resources in the Suisun-Fairfield Valley groundwater basin
    - Conducting an agriculture water use demand study.

However, in this section, broader high-level actions are presented to support the goals and strategies.

- **Conceptual Projects**: The Framework outlines three conceptual projects in Section 5 to illustrate how strategies and actions can address challenges. These projects integrate water supply, wastewater, and drainage improvements with flood protection and ecosystem enhancements.

Goal 1: Support Implementation of the Solano County General Plan in Relation to Integrated Water Resources Planning

This goal was established to align water management with the County's broader development, land use, economic, and resilience objectives, supporting agricultural growth and addressing infrastructure needs, environmental sustainability, and public health concerns. Integrating water resources planning with the General Plan allows the County to develop and implement adaptive strategies, such as infrastructure designed for resilience, sustainable groundwater recharge projects, and flood protection measures that also support agricultural activities.

Progress towards meeting this goal will be made by actions that fall into the following strategies:

Strategy 1A Improve the Collective Understanding of the Utility Services and Needs Within the Unincorporated Areas of Solano County.

A collective understanding of the utility services and needs is required to address a range of complex and intersecting challenges in Solano County. These issues span water quality, diverse water supplies, infrastructure needs, and regulatory alignment. They reveal the need for a cohesive approach in water resources management. For example, Solano County relies on multiple water sources, including groundwater and surface water from the Solano Project, Delta water rights, and the State Water Project through the North Bay Aqueduct. The unincorporated areas, particularly those relying on isolated groundwater systems, face challenges such as declining water levels and naturally occurring contaminants like arsenic and nitrate, which compromise drinking water quality and availability. Integrating water resources planning with the General Plan supports systematic approaches to address these diverse water supply needs, allowing the County to enhance water accessibility across regions, ensure quality control, and maintain a secure water supply.

Actions:

Assess the water utility requirements based on County land use and zoning areas includes evaluating water supply constraints, particularly for agricultural regions like Green/Suisun Valleys and Dixon Ridge, as these areas look to grow through agri-tourism and agricultural processing. The focus is on ensuring access to reliable water resources to support agricultural economy while addressing climate-related vulnerabilities such as declining groundwater and reduced surface water reliability.

Strategy 1B Assess the Water Utility Requirements Based on County Land Use and Zoning Areas.

The General Plan emphasizes resilience against climate impacts and public health, including increasing drought severity and the risk of flooding. Many agricultural and rural areas in the County face rising vulnerability due to climate-related changes, such as declining groundwater and reduced surface water reliability.

Agriculture is central to Solano County's economy; however, water supply constraints pose challenges for expansion in agricultural regions like Green/Suisun Valleys and Dixon Ridge among other areas including agricultural industrial service areas. As these areas look to grow through agri-tourism, agricultural processing, and agricultural-support service Industries, they will need increased access to reliable water resources.

Actions:

Assess the water utility requirements in agritourism priority areas based on County land use and zoning areas includes evaluating water supply constraints, particularly for agricultural regions like Green/Suisun Valleys and Dixon Ridge, as these areas look to grow through agri-tourism and agricultural processing. The focus is on ensuring access to reliable water resources to support expansion while addressing climate-related vulnerabilities such as declining groundwater and reduced surface water reliability.

Strategy 1C: Align Water Resources Planning with General Plan Guiding Principles

The Solano County General Plan emphasizes sustainability, water conservation, efficient irrigation methods, and partnerships with relevant agencies to sustain agricultural productivity. Aligning water resources planning with these guiding principles ensures that infrastructure investments support sustainable agricultural growth, balance economic development priorities with resource limitations, and enhance environmental resilience.

Actions:

- **Integrate General Plan Objectives into Water Planning:** Incorporate the General Plan's sustainability and conservation goals into all water resource planning efforts to ensure consistency across policies and projects.
- **Prioritize Infrastructure Investments:** Focus on infrastructure upgrades that support efficient water use, improve water quality, and address areas with high vulnerability to water shortages and contamination.
- **Foster Interagency Partnerships:** Collaborate with local, regional, and state agencies to develop and implement water management strategies that align with the General Plan's objectives, promoting coordinated efforts in conservation and resource management.
- **Promote Efficient Irrigation Practices:** Encourage the adoption of advanced irrigation technologies and practices among agricultural stakeholders to optimize water use efficiency and reduce waste.

- **Enhance Public Awareness:** Develop educational programs to inform the community about the importance of water conservation and the role of the General Plan in guiding sustainable water use practices.

By aligning water resources planning with the General Plan's guiding principles, Solano County can achieve a cohesive approach to water management that supports agricultural sustainability, environmental health, and community well-being.

Goal 2: Develop Governance Structures to Support Regional Water Resources Management through Interagency Collaboration and Partnership

The goal of developing governance structures is to address the multiple, interrelated challenges identified in Section 2 Regional Challenges and Issues. This goal emerged as a response to the region's fragmented water management responsibilities, complex regulatory landscape, and diverse water needs across agricultural, urban, and rural communities.

Solano County's water management involves a wide array of agencies and districts, each with distinct responsibilities. The involvement of entities such as local cities, water districts, reclamation districts, and conservation districts create a complex, often fragmented network. Each agency operates under different mandates, complicating the unified management of water resources. Establishing governance structures that promote regional collaboration can streamline decision-making processes, reduce redundancies, share costs, and create unified responses to issues like water supply, groundwater management, and infrastructure maintenance. Examples of regional governance structures that could provide models for future efforts is the Dixon Regional Watershed Joint Powers Authority, the Solano Subbasin Groundwater Sustainable Agency and the Solano Collaborative.

Progress towards meeting this goal will be made by the following strategies:

Strategy 2A: Coordinate with, Leverage, and Support Existing Regional Water Management Working Groups

Solano County aims to address water-related challenges by fostering collaboration among various entities, including water purveyors, municipalities, water management agencies, the SCWA, Solano Water Authority, Groundwater Sustainability Agencies (GSAs), and others. This strategy emphasizes the importance of working with established groups to enhance stakeholder engagement, pool resources, and create synergies across different sectors. This collaborative approach presents opportunities to leverage resources, enhance stakeholder engagements and improve integrated planning efforts.

Actions:

- **Engage with Regional Water Entities:** Participate in working groups like the Westside Sacramento Integrated Regional Water Management (IRWM) Group, Drought Task Force, GSAs, and SWAC, which includes various agencies in Solano and neighboring counties, to share knowledge and coordinate efforts and align water resource management strategies.

- **Support Integrated Planning Efforts:** Contribute to the development and implementation of comprehensive water management plans to address shared challenges and opportunities.
- **Participate in the One Water Framework:** Engage in initiatives like the One Water Framework to promote a holistic approach to water management, recognizing the interconnectedness of all water resources.

By implementing this strategy, Solano County can effectively address its water-related challenges through coordinated efforts, leading to a more sustainable and resilient water management system.

Strategy 2B: Evaluate Options and Recommend a Governance Structure to Implement the One Water Framework and Develop the Future Solano County Utilities Master Plan

Solano County aims to enhance water resource management by adopting a holistic approach through the One Water Framework, which considers all water sources—surface water, groundwater, stormwater, and wastewater—as interconnected resources. Establishing an integrated governance structure presents opportunities to improve resource management, enhance climate resilience, and support smaller water systems. By evaluating and implementing such a structure, the county can ensure effective coordination among various agencies and stakeholders, leading to a more sustainable and equitable water future.

Actions:

- **Assess Existing Governance Models:** Review current water management structures within the county and other regions to identify best practices and potential areas for improvement.
- **Engage Stakeholders:** Involve water purveyors, municipalities, water management entities, Groundwater Sustainability Agencies, and community representatives in discussions to gather diverse perspectives and build consensus on governance reforms.
- **Develop Governance Recommendations:** Based on assessments and stakeholder input, propose a governance structure that promotes integrated water management, aligns with the One Water Framework principles, and supports the development of the water resources component for a Solano County Utilities Master Plan.
- **Implement and Monitor:** Establish the recommended governance structure and continuously monitor its effectiveness, making adjustments as necessary to adapt to evolving challenges and opportunities.

By establishing an integrated governance structure, Solano County can effectively coordinate efforts across various water systems, enhancing sustainability and resilience in its water management practices.

Goal 3: Enhance Local Sustainable Water Supply and its Reliability and Climate Change Resiliency

This goal underscores Solano County's need to develop a sustainable, reliable, and resilient water supply that can adapt to the County's agricultural, environmental, and residential needs while countering pressures from climate change. By addressing the root causes of water stress, this goal supports a comprehensive approach to long-term water management, aiming to protect public health, sustain agriculture, and bolster environmental resilience across the county.

Progress towards meeting this goal will be made through the following strategies:

Strategy 3A: Evaluate and Enhance Small Water System Reliability with a Focus on Vulnerable, Underserved, and Disadvantaged Communities

Small water systems in Solano County, particularly in rural and agricultural areas, often operate independently with limited infrastructure. Many of these systems rely on single wells or limited surface water sources, making them highly vulnerable to disruptions, such as well failures or contamination incidents. Increasing system redundancy through consolidation, inter-ties, or additional sources would provide backup options, reducing the risk of supply interruptions for these isolated communities. Additionally, many small water systems face water quality issues, with some reporting elevated levels of contaminants such as arsenic, hexavalent chromium, and nitrates. Disadvantaged communities relying on these systems often lack access to efficient treatment facilities, making it challenging to provide safe drinking water.

Consolidation of small water systems offers significant opportunities to enhance water supply reliability and quality. By merging resources, these systems can achieve economies of scale, leading to reduced operational and maintenance costs. Larger, consolidated systems are better positioned to invest in advanced treatment technologies and infrastructure improvements, thereby ensuring compliance with regulatory standards and enhancing public health outcomes. Moreover, a unified approach facilitates better planning and management, increasing resilience against climate change impacts and other potential disruptions. For rural and underserved communities, consolidation can provide access to technical expertise and financial resources that might otherwise be unavailable, promoting equity in water service delivery.

Actions:

- **Assess System Vulnerabilities:** Conduct comprehensive evaluations of small water systems to identify weaknesses and potential points of failure.
- **Explore Consolidation Opportunities:** Investigate the feasibility of merging smaller systems with larger ones or creating regional networks to enhance redundancy.
- **Secure Funding for Upgrades:** Pursue grants and other funding sources to support infrastructure improvements and consolidation efforts.
- **Engage Communities:** Involve residents and stakeholders in planning and decision-making processes to ensure solutions meet local needs.

By focusing on the consolidation and enhancement of small water systems, Solano County can ensure a more reliable and safe water supply for all its residents, especially those in underserved communities.

Strategy 3B: Support Active Groundwater Recharge Activities in Areas with Historically Low and Declining Groundwater Levels

Solano County relies on groundwater for agricultural, domestic, industrial, and commercial uses, especially in rural areas lacking access to surface water supplies. Historical declines in groundwater levels, particularly in regions like the Northwest Focus Area of the Solano Subbasin, have heightened vulnerability to water shortages, especially during prolonged droughts. Shallow domestic wells are more susceptible to changes in groundwater levels, increasing the risk of shortages during extended dry periods. Additionally, declining groundwater levels elevate the risk of saline intrusion in the western bayshore regions, rendering water unsuitable for both agricultural and potable purposes. By actively supporting recharge activities, the County can stabilize groundwater levels, reduce the risk of wells running dry, and protect water quality, thereby sustaining water supplies for residents and other users. An additional potential benefit of groundwater recharge is the infiltration and storage of stormwater in upper watersheds. This approach can help address water supply challenges, improve water quality, and reduce downstream flooding impacts, aligning with Strategy 5B in Goal 5.

Actions

- **Identify Suitable Recharge Sites:** Conduct hydrogeological assessments to pinpoint areas with favorable conditions for effective groundwater recharge, such as regions with permeable soils and appropriate subsurface characteristics.
- **Develop Recharge Projects:** Design and implement projects like infiltration basins, recharge ponds, or the use of agricultural lands for MAR during off-peak seasons.
- **Collaborate with Stakeholders:** Engage with local farmers, water agencies, and community organizations to promote recharge initiatives, providing education on best practices and potential benefits.
- **Secure Funding and Streamline Permitting:** Pursue state and federal funding opportunities and advocate for streamlined permitting processes to facilitate the timely implementation of recharge projects.

By focusing on active groundwater recharge in areas with historically low and declining groundwater levels, Solano County can enhance water sustainability, protect against environmental threats, and promote the well-being of its communities.

Strategy 3C: Evaluate Water Demand and Supply in Suisun Valley and Surrounding Areas to Support the Agricultural Economy

The Suisun Valley and other agricultural regions in Solano County are poised for economic growth, with plans for vineyard expansions, agritourism, and agricultural processing. These developments necessitate additional water for irrigation, domestic use, and industrial processes. However, these areas face significant water supply challenges due to infrastructure limitations and reliance on vulnerable groundwater resources. For instance, the Suisun-Fairfield Valley

Groundwater Basin, underlying the Suisun Valley, is constrained by areas along the western hills of low capacity and along the southern portions of the valley that have brackish groundwater, issues that may be exacerbated by sea-level rise near the bayshore areas, further limiting its utility for agricultural or domestic purposes.

Addressing these challenges presents opportunities for strategic infrastructure planning and sustainable resource management. Evaluating current water demand against existing infrastructure capabilities provides insight into necessary system expansions, such as new pipelines, storage, or treatment facilities, to support agricultural growth. A comprehensive assessment allows for the development of strategies to balance water supply and demand, ensuring the long-term viability of agricultural operations. Additionally, by addressing water supply challenges, the county can promote the expansion of agritourism and value-added agricultural activities, boosting the local economy.

Actions:

- **Conduct Comprehensive Water Assessments:** Analyze current and projected water demands alongside existing supply capacities in the Suisun Valley and other agricultural areas to identify gaps and future needs.
- **Develop Infrastructure Improvement Plans:** Based on assessment findings, plan and prioritize infrastructure projects, such as enhancing conveyance systems and developing new water sources, to meet the anticipated water demands of agricultural expansions.
- **Implement Sustainable Groundwater Management Practices:** Adopt measures to protect and sustainably manage groundwater resources, considering potential impacts of climate change and sea-level rise on water quality and availability.
- **Engage Stakeholders:** Collaborate with local farmers, water agencies, and community members to ensure that water management strategies align with agricultural development goals and community interests.

By taking a strategic, data-informed approach to water resource planning, Solano County can effectively support agricultural economic development while safeguarding vital water resources.

Strategy 3D: Explore Alternative Water Supply Sources to Meet Demands, Including Recycled Water and Stormwater

Solano County faces challenges such as declining groundwater levels in areas like Dixon Ridge and Western Hills, vulnerabilities in small water systems, and the impacts of climate change, including prolonged droughts. These factors strain traditional water sources and highlight the need for alternative supplies. Expanding the use of recycled water and capturing stormwater can supplement existing resources, ensuring more stable water availability. For instance, wastewater treatment plants in Solano County produce effluent that could be repurposed for agricultural irrigation, landscaping, or other non-potable uses. FSSD has budgeted for a recycled water master plan within the next several years, but will need regional partners (especially Fairfield and SID who share in ownership of FSSD recycled water rights, as well as Solano Co) to find potential users. (FSSD 2025). Additionally, as of January 1, 2025, landscaping projects in unincorporated areas with at least 500 square feet may be required to meet Solano County's Water Efficient Landscape Ordinance and incorporating recycled water

can assist in compliance. Furthermore, stormwater capture infrastructure can serve multiple purposes, such as flood risk reduction, irrigation, groundwater recharge, and ecosystem restoration, aligning with the county's multi-benefit project goals.

Actions:

- **Assess Feasibility of Recycled Water Use:** Conduct studies to evaluate the potential for expanding recycled water applications, including identifying suitable end-uses and necessary infrastructure enhancements.[29]
- **Develop Stormwater Capture Projects:** Design and implement stormwater capture systems that can be utilized for non-potable purposes, such as irrigation and groundwater recharge, while also providing flood control benefits.
- **Engage Stakeholders and Educate the Public:** Collaborate with local communities, businesses, and regulatory agencies to promote the benefits of alternative water sources and address public perceptions and concerns.
- **Secure Funding and Partnerships:** Pursue funding opportunities and establish partnerships with regional agencies and organizations to support the development and implementation of alternative water supply projects.

By exploring and implementing alternative water supply sources, Solano County can enhance its water sustainability, support economic growth, and improve resilience to climate change impacts.

Strategy 3E: Improve Water Conveyance and Delivery Infrastructure to Support Current and Future Supplies

Several agricultural regions in Solano County, including Western Hills, Pleasants/Vaca/Lagoon Valleys, Winters, Dixon Ridge, and Elmira/Maine Prairie, have experienced declining groundwater levels, with some areas relying on aquifers susceptible to overuse, especially during drought conditions. Strengthening water conveyance infrastructure can provide alternative surface water supplies, reducing over-reliance on fragile groundwater resources. Additionally, poor groundwater quality is an issue in parts of the county, with contaminants such as arsenic, hexavalent chromium, and nitrates affecting various regions. Infrastructure investments can expand access to treated surface water, ensuring clean and safe drinking water for rural communities and agricultural operations. Notably, seven small water systems in unincorporated Solano County have been evaluated as failing, at-risk, or potentially at-risk in terms of water quality, accessibility, and affordability. Many of these systems lack redundancy, meaning a single failure could leave entire communities without water. Infrastructure improvements, such as pipeline expansions and new conveyance facilities, would enhance system reliability and resilience. Investing in water conveyance and delivery infrastructure is a critical solution for Solano County, addressing current vulnerabilities while preparing for future demands.

Actions:

- **Assess Infrastructure Needs:** Conduct comprehensive evaluations of existing water conveyance and delivery systems to identify deficiencies, capacity limitations, and areas requiring upgrades.
- **Develop Improvement Plans:** Design strategic plans for infrastructure enhancements, including pipeline expansions, new conveyance facilities, and integration of advanced technologies to optimize water delivery efficiency.
- **Secure Funding and Partnerships:** Pursue federal, state, and local funding opportunities, and collaborate with stakeholders such as water agencies, agricultural entities, and community organizations to support infrastructure projects.
- **Implement Upgrades:** Execute planned infrastructure improvements in phases, prioritizing areas with the most critical needs to ensure a systematic enhancement of the water delivery network.

By investing in the improvement of water conveyance and delivery infrastructure, Solano County can ensure the availability of reliable, high-quality water supplies to meet current needs and support future growth, thereby enhancing the resilience and prosperity of its communities.

Goal 4: Improve Localized Drainage, Flood Protection, and Wastewater Management

Improving localized drainage, flood protection, and wastewater management directly addresses Solano County's key challenges by reducing flood risks, protecting water quality, supporting public health, and enabling sustainable growth. By strengthening these systems, Solano County can enhance its climate resilience, reduce infrastructure costs, and protect both natural and human environments from the compounded effects of flooding and wastewater contamination.

Progress towards meeting this goal will be made through the following strategies:

Strategy 4A Integrating Nature-Based Solutions in Drainage, Wastewater and Agriculture/Urban Areas to Reduce Climate Change Impacts.

Areas in Solano County are confronted with climate-related challenges including:

- Flood risks in low-lying regions such as Suisun Marsh which are increasing susceptible due to extreme weather events and sea level rise.
- Urban, industrial, and agricultural runoff that can contribute pollutants to downstream ecosystems and potable water sources or contribute to soil erosion, diminishing soil health and reducing water retention capacity.
- Rural areas lacking centralized wastewater treatment face environmental and public health risk from inadequate wastewater management.

Actions:

- **Implement Green Infrastructure:** Encourage project proponents to proactively implement green infrastructure such as bioswales, rain gardens, and constructed wetlands to enhance natural water absorption, slow runoff, and reduce flood risks. These systems utilize natural processes to manage stormwater sustainably.
- **Establish Vegetated Buffers:** Partner with agencies to create riparian buffers and vegetated zones adjacent to water bodies to filter pollutants from agricultural and/or industrial runoff, thereby improving water quality and protecting aquatic ecosystems.
- **Promote Sustainable Agricultural Practices:** Coordinate with RCD and agricultural community to encourage soil conservation techniques, cover cropping, and agroforestry to enhance soil health, reduce erosion, and increase groundwater recharge, leading to more resilient agricultural systems.
- **Adopt Nature-Based Solutions for Stormwater:** Evaluate utilizing constructed wetlands and other nature-based systems in rural areas to treat runoff effectively, offering cost-efficient alternatives to centralized treatment facilities. Wetlands and vegetated buffer zones can filter pollutants from runoff before they enter waterways, improving water quality. This is particularly important for agricultural areas where runoff may contain fertilizers and pesticides, as these pollutants threaten downstream ecosystems and water sources.
- **Develop Agricultural Buffers:** Implement buffer zones between agricultural and urban areas to mitigate conflicts and environmental impacts, such as noise, dust, odor, and pesticide drift, fostering harmonious land use transitions.

By integrating these or other nature-based solutions, Solano County aims to enhance climate resilience, improve environmental quality, and promote sustainable land use practices.

Strategy 4B Identify Data Gaps and Conduct Modeling Studies to Enhance Flood Management and Drainage in Solano County.

Solano County is susceptible to significant flood risks, particularly in low-lying regions such as Suisun Marsh, areas east of the Dixon Ridge, and Elmira-Maine Prairie. To develop effective flood management strategies tailored to each region's specific needs, it is essential to identify existing data gaps and conduct comprehensive modeling studies to address challenges including:

- **Aging Infrastructure:** Many parts of the county rely on outdated drainage systems that may be inadequate for handling increased runoff resulting from urbanization and the heightened intensity and frequency of extreme weather events. This inadequacy could lead to more severe flooding.
- **Sea Level Rise:** Low-lying areas near Suisun Marsh and other coastal zones, including Suisun Valley, are particularly vulnerable to sea level rise. This phenomenon can exacerbate flood risks and lead to saltwater intrusion into freshwater resources.

Actions

- **Identify Data Gaps:** Collaborate with agencies including Solano County Water Agency, Reclamation Districts and Resource Conservation Districts to conduct a thorough assessment to pinpoint deficiencies in current flood risk data, encompassing localized flood-prone zones and infrastructure vulnerabilities. This process is crucial for obtaining the necessary information to create robust, region-specific flood management strategies.
- **Conduct Modeling Studies:** Implement modeling studies in priority flood-prone areas to evaluate the capacity of existing drainage systems. These studies will identify where infrastructure improvements are needed to withstand future events, considering factors such as increased runoff from urbanization and more extreme weather patterns.
- **Assess Sea Level Rise Impacts:** Coordinate with entities as part of the Bayshore Resiliency Project to gather data to identify critical high-risk areas, vulnerable assets and communities susceptible to flooding and sea level rise. This information will inform mitigation measures aimed at protecting communities and agricultural lands from the adverse effects of rising sea levels.

By addressing these data gaps and enhancing modeling capabilities, Solano County can develop infrastructure and land-use plans that are resilient to changing climate conditions, thereby safeguarding at-risk communities and agricultural areas and foster coordinated regional flood control efforts, ensuring a unified and effective approach to flood management across the county.

Strategy 4C Implement Multi-Benefit Solutions for Flood Protection, Agricultural, and Community Enhancement

Solano County faces a confluence of environmental challenges that necessitate integrated solutions. Notably, regions such as Suisun Valley, Dixon Ridge, and Elmira/Maine Prairie are susceptible to flooding due to inadequate and fragmented flood management infrastructure, leading to crop loss and property damage. Compounding this issue, these areas also experience groundwater depletion, threatening long-term water security. Furthermore, there is a pressing need for accessible recreational spaces that promote community well-being and attract tourism. Addressing these interconnected challenges requires a holistic approach that simultaneously enhances flood protection, supports groundwater recharge, and provides recreational opportunities.

Actions:

- **Develop Integrated Flood Management Systems:** Coordinate with entities to implement nature-based infrastructures, such as constructed wetlands and riparian buffers, to enhance flood protection, improve water quality, and provide habitats for wildlife. These systems can also offer recreational opportunities, thereby supporting local tourism and community engagement.
- **Promote Sustainable Agricultural Practices:** Collaborate with RCDs and other entities on outreach and trainings to farmers to encourage farming techniques that enhance soil health and water retention, such as cover cropping and conservation tillage. These practices can improve crop yields, reduce input costs, and increase resilience to climate variability, thereby strengthening the agricultural economy.

- **Enhance Market Access for Farmers:** Develop infrastructure, such as farm-to-market roads and local processing facilities, to improve farmers' access to markets. This can increase profitability and encourage the growth of local food systems, fostering economic development in rural areas.
- **Support Agricultural Diversification:** Encourage the cultivation of high-value or specialty crops that can open new markets and reduce economic risks associated with monoculture farming while recognizing that diversification is not applicable or practical for all agricultural operations. The County should recognize and quantify the economic contributions of existing agricultural enterprises and avoid land use changes that could place these established operations at risk. Diversification, can also enhance ecological resilience and provide additional income streams for farmers; however, these efforts should complement-rather than displace- existing productive uses, supporting both economic resilience and long-term agricultural viability.
- **Ensure Development in Unincorporated Areas Contributes to Multi-Benefit Solutions:** Integrate water resource, flood management, and land use planning to ensure that new development in unincorporated areas contributes to regional, multi-benefit solutions—supporting stormwater management, groundwater recharge, habitat enhancement, and agricultural resilience. Development should be planned and designed to complement existing regional infrastructure, reduce downstream impacts, and align with long-term sustainability goals.

Benefits

Implementing these actions will enhance flood protection, promote sustainable agricultural practices, improve market access, support diversification, when applicable, and invest in education, thereby strengthening the agricultural economy and overall resilience of Solano County's rural areas.

Goal 5: Implement Multi-Benefit Strategies, Projects, and Programs through the Management and Integration of all Water Resources

Solano County aims to address its unique water-related challenges through the integrated management of water resources, employing multi-benefit strategies, projects, and programs. This comprehensive approach not only tackles current issues but also enhances the county's resilience against future uncertainties related to water scarcity, environmental needs, and climate change impacts.

Progress towards meeting this goal will be made through the following strategies:

Strategy 5A Identify opportunities and constraints in utilizing existing water infrastructure for multiple benefits.

Solano County aims to optimize existing water infrastructure to serve multiple purposes, thereby enhancing efficiency and sustainability. This strategy involves coordinating with purveyors to assess current systems to identify potential opportunities; such as cost efficiency and enhanced collaboration along with identifying constraints such as system capacity limitations, regulatory requirements and financial constraints in expanding their functions. Optimizing existing systems

can be more cost-effective than building new infrastructure, however, securing funding for modifications, especially for non-traditional uses, can be a challenge. Limited budgets and competing priorities can create financial constraints, particularly if upgrades require extensive investment.

Actions:

- **Conduct Comprehensive Assessments in Priority Areas:** Identify priority areas for focus and evaluate the current state of water infrastructure to determine capacity, technological adequacy, and potential for multi-purpose utilization.
- **Foster Partnerships:** Engage with regional water agencies and stakeholders to explore collaborative opportunities for shared infrastructure use and resource management.
- **Identify Funding Mechanisms:** Explore grants, public-private partnerships, and other funding sources to support necessary infrastructure upgrades for multi-benefit applications.
- **Address Regulatory Challenges:** Work with regulatory bodies to align water quality standards and obtain necessary approvals for expanded infrastructure uses.

By proactively identifying and addressing these opportunities and constraints, Solano County can effectively utilize its existing water infrastructure to achieve multiple benefits, promoting sustainability and resilience in water resource management.

Strategy 5B Identify and Develop Conceptual Multi-Benefit Project Scenarios for Integrated Solutions in Solano County.

Solano County seeks to address its diverse challenges through the identification and development of conceptual multi-benefit projects. Three conceptual projects are outlined in Section 5 that provides example of integrating the One Water approach for multiple benefits. This approach aims to create integrated solutions that simultaneously tackle environmental, social, and economic issues, fostering a sustainable and resilient future for the community. Opportunities include; synergistic solutions by designing projects that address multiple challenges concurrent to achieve greater impact and enhanced funding by aligning priorities with state and federal programs and private or nonprofit organizations through partnerships and integration for long-term planning and sustainability.

Actions

- **Conduct Comprehensive Assessments in Priority Areas:** Evaluate current challenges and opportunities within the County to identify areas where multi-benefit projects can be most effective. This includes assessing environmental issues, infrastructure needs, and community priorities.
- **Engage Stakeholders:** Collaborate with community members, local businesses, environmental groups, and governmental agencies to gather diverse perspectives and insights. This inclusive approach ensures that proposed projects address the actual needs and desires of the community.

- **Develop Conceptual Project Scenarios:** Based on assessments and stakeholder input, create a list of potential multi-benefit project scenarios. Each project should outline the specific challenges it addresses, the anticipated benefits, potential funding sources, and any implementation constraints.
- **Prioritize Projects:** Establish criteria to evaluate and prioritize the proposed projects. Consider factors such as feasibility, cost-effectiveness, potential impact, and alignment with County goals and available funding opportunities.
- **Seek Funding and Partnerships:** Identify grant programs, private investors, and nonprofit organizations that support multi-benefit initiatives. Develop proposals and build partnerships to secure the necessary resources for project implementation.

By systematically identifying and developing multi-benefit project scenarios, Solano County can implement integrated solutions that efficiently utilize resources, attract funding, and promote sustainable development. This strategic approach ensures that efforts to address challenges are coordinated, comprehensive, and aligned with the long-term well-being of the community.

Strategy 5C Expand Water-Related Benefits Beyond Climate Resiliency, Food Protection, and Water Supply Reliability

Solano County recognizes that its water resource challenges extend beyond climate resiliency, flood protection, and water supply reliability. Issues such as biodiversity loss, sustaining agricultural economy, and limited recreational spaces also significantly impact the region. To address these interconnected challenges, the County aims to adopt a comprehensive approach that integrates ecosystem enhancement, wildlife-friendly agricultural practices, and the development of recreational opportunities. This strategy seeks to foster environmental stewardship, support the agricultural economy, and enhance community well-being, aligning with the goals outlined in the Solano County One Water Framework.

Actions:

- **Focus Ecosystem Restoration Projects on Publicly-Owned Lands:** Restore wetlands, riparian zones, and other critical habitats to support native biodiversity and improve water quality on publicly owned lands to preserve private lands to support agriculture economy.
- **Promote Wildlife-Friendly Farming:** Encourage agricultural practices that protect wildlife habitats, such as maintaining hedgerows and implementing integrated pest management.
- **Develop Recreational Infrastructure:** Create parks, trails, and other recreational facilities that provide community access to natural areas and promote environmental education.

By broadening the scope of water-related projects to include these additional benefits, Solano County can develop integrated solutions that address multiple challenges simultaneously, aligning with the principles outlined in the Solano One Water Framework.

Section 4: Implementation Strategy

4.1 Overview of Implementation Strategies

The One Water Framework has identified key challenges and opportunities to Solano County's integrated water resource management. To address these issues, this section outlines a structured strategy with key implementation actions to develop a Water Resources component for a Utilities Master Plan (Master Plan). This strategy emphasizes data-driven decision-making, infrastructure enhancements, stakeholder collaboration, and policy alignment to ensure long-term sustainability. Initially, Partnership Agreements will identify appropriate agencies for coordination, delineate data responsibilities, and outline data gathering and analysis processes. Subsequent actions and policy implementation will be based on this data. Figure 4-1 illustrates how these actions evolve over time and can be summarized as implementation actions:

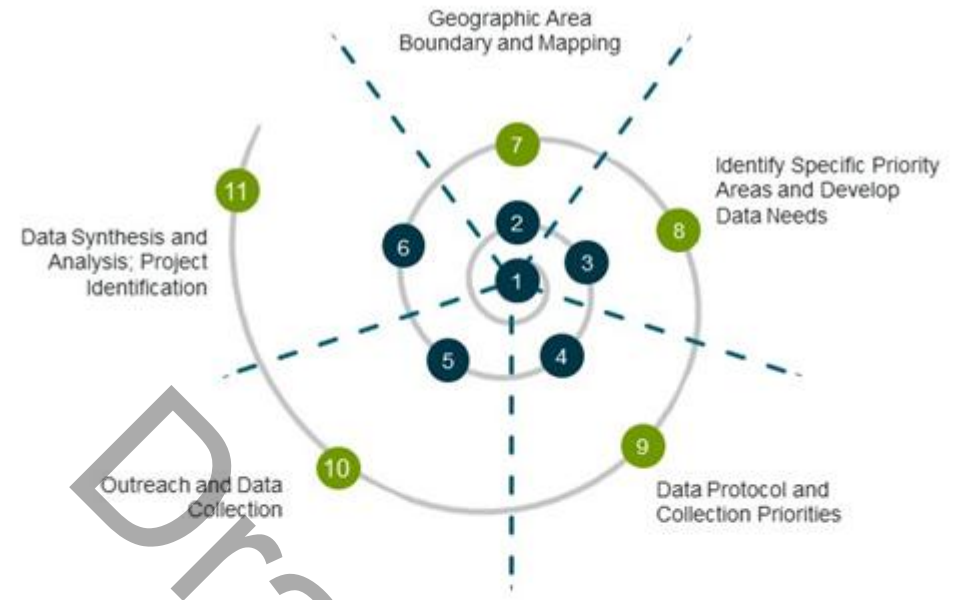
Partnerships & Agreements – Strengthening coordination among agencies and stakeholders.

Data Collection, Analysis & Synthesis – Enhancing data availability and management for informed decision making.

Policy Implementation & Updates – Aligning policies with integrated water resource strategies.

Public Engagement & Education – Increasing community involvement and awareness.

These actions serve as the foundation for developing sustainable, multi-benefit water projects that align with the Solano County General Plan.



Near-Term

1. Initial partnership coordination
   - Goals of Coordination
   - Roles and Responsibilities of Agencies
   - Need for Agreements/MOUs
2. Initial data gathering and mapping
3. Identify detailed mapping and data for priority area
4. Develop data collection protocol and identify property owners and agencies for priority area
5. Conduct outreach to property owners and agencies and data collection
6. Initial data synthesis and analysis including mapping/modeling/report updates/identify initial projects

Mid-Term

7. Refined data gathering and mapping
8. Refined data and mapping for priority area
9. Refined data collection
10. Refined outreach for data collection
11. Refined Data synthesis and analysis and project development

Figure 4-1: One Water Actions

4.2 Partnership Development & Institutional Collaboration

4.2.1 Strengthen Existing Partnerships

To enhance collaboration, Solano County will work with partners to identify appropriate lead agency(ies) who will have the responsibility for data collection, project development, and implementation. These partnerships can build upon existing venues or agreements for water supply, wastewater, and flood management initiatives, summarized in Table 4-1, as appropriate.

Key actions may include:

- Expanding the Solano Water Advisory Commission to include flood management and wastewater agencies to collaborate on multi-benefit water resource projects and programs. This key action for flood/drainage/stormwater has been initiated under the leadership of SCWA and Dixon RCD with plans to convene quarterly meetings.
- Strengthening cooperation with SCWA, local irrigation districts, wastewater districts, and city water departments.
- Engaging the Dixon Regional Watershed JPA, Reclamation Districts, and Resource Conservation Districts (RCDs) to facilitate flood management efforts.

4.2.2 Develop New Coordination Agreements

New agreements will be established to define responsibilities, clarify jurisdictional issues, and improve regional coordination. **Key actions may include:**

- **Developing new agreements** for shared water resource management between Solano County, water related special districts, and municipalities.
- **Creating interagency agreements** for streamlined flood response and stormwater drainage maintenance.
- **Supporting funding partnerships** between public agencies and private stakeholders to expand infrastructure investments.

Examples of the potential opportunities for collaboration are presented in Table 4-1 and in the Conceptual Projects Section 5.

Table 4-1: Existing Partnership Coordination or Agreements

Partnership Coordination / Agreement	Challenges to Address			Supported Goals*				
	Water Supply and Conveyance	Wastewater Management	Drainage and Flood Management	1	2	3	4	5
Solano Drought Taskforce/ Solano County Drought Resilience Plan	x			x	x	x		x
Solano Water Advisory Commission	x			x		x		x
Solano Bayshore Resiliency Roundtable	x	x	x			x		x
City County Coordinating Council	x	x	x	x	x			

Partnership Coordination / Agreement	Challenges to Address			Supported Goals*				
	Water Supply and Conveyance	Wastewater Management	Drainage and Flood Management	1	2	3	4	5
Dixon Regional Watershed Joint Powers Authority (Regional Watershed JPA)			x				x	
Solano Groundwater Sustainability Agencies/ Solano Subbasin Groundwater Sustainability Plan	x		x	x	x	x	x	x
Cache Slough Complex Habitat Conservation Plan	x			x		x		x
Yolo Bypass Cache Slough Partnership	x		x			x	x	x
Solano County Multi-Jurisdictional Hazard Mitigation Plan	x	x	x	x		x		x
Vallejo Lakes Water System Joint Exercise of Powers Agreement (Vallejo Lakes Water System JEPA)	x			x		x		
Suisun/Solano Water Authority Joint Exercise of Powers Agreement	x			x		x		
Solano Water Authority Joint Exercise of Powers Agreement (SWA JEPA)	x	x		x		x		x

*Goals:
1: Support Implementation of the Solano County General Plan for Integrated Water Resources Planning
2: Develop Governance Structures to Support Regional Water Resources Management through Interagency Collaboration and Partnership
3: Enhance Local Sustainable Water Supply and its Reliability and Climate Change Resiliency
4: Improve Localized Drainage and Flood Protection
5: Implement Multi-Benefit Strategies, Projects, and Programs through the Management and Integration of all Water Resources

Table 4-2: Additional Collaboration

Partnership/ Agreement/ MOU	Potential Partners	Challenges to be Addressed			Supported Goals				
		Water Supply/ Conveyance	Wastewater Management	Drainage and Flood Management	1	2	3	4	5
Drainage/Flood Management Studies	Solano County; SCWA, Dixon Regional Watershed JPA; RD 2068	x		x	x	x	x	x	x
Groundwater Recharge Studies	Solano County, SCWA; Solano Subbasin GSA Collaborative; RCDs; University of California, Davis	x		x	x			x	x
Programmatic Creek Clearing/ Maintenance (Conceptual Project #1)	Solano County; SCWA; RCDs; Cal Trans*; Cities*			x		x		x	
Regional Drainage/Flood Multi-Benefit Project Coordination (Conceptual Project #2)	Solano County; SCWA; Dixon Regional Watershed JPA; Solano Subbasin GSA Collaborative	x		x		x	x	x	x

Partnership/ Agreement/ MOU	Potential Partners	Challenges to be Addressed			Supported Goals				
		Water Supply/ Conveyance	Wastewater Management	Drainage and Flood Management	1	2	3	4	5
Green Valley/Suisun Valley Water and Wastewater Assessment Study (Conceptual Project #3)	Solano County, SCWA; SID; FSSD; Cities of Vallejo or Fairfield	x	x		x	x	x		x

Notes:
*Caltrans and/or Cities may collaborate on creek maintenance based on jurisdictional areas

Goals:
1: Support Implementation of the Solano County General Plan in Relation to Integrated Water Resources Planning
2: Develop Governance Structures to Support Regional Water Resources Management through Interagency Collaboration and Partnership
3: Enhance Local Sustainable Water Supply and its Reliability and Climate Change Resiliency
4: Improve Localized Drainage and Flood Protection
5: Implement Multi-Benefit Strategies, Projects, and Programs through the Management and Integration of all Water Resources

4.3 Data Collection, Analysis, & Infrastructure Assessments

4.3.1 Develop a Centralized Data Management System

To address challenges described in Section 2, Solano County and key stakeholders shall develop a centralized data management system maintained by Solano County. A GIS-based data management protocol will be developed to track water supply, wastewater, and stormwater infrastructure. **Key actions may include:**

- Mapping all existing water supply, wastewater treatment, and stormwater systems.
- Collecting and standardizing groundwater and surface water monitoring data.
- Establishing data-sharing and funding agreement(s) among agencies for water resource tracking.

4.3.2 Conduct Infrastructure Assessments & Monitoring

To improve system efficiency, infrastructure condition assessments will be conducted. **Key actions may include**:

- Inventorying public and private wells, evaluating water quality, reliability, and production capacity.
- Assessing septic and wastewater treatment facilities, identifying system vulnerabilities and upgrade needs.

- Exploring consolidation opportunities for small water systems.
- Evaluating flood control structures, ensuring they meet current and future flood and climate change needs.
- Developing a countywide drainage and flood control management plan.

4.3.3 Perform Hydrological & Groundwater Studies

To support long-term water resource planning, hydrological and groundwater studies will be performed to assess recharge potential, contamination risks, and future water demands. **Key actions may include:**

- Developing a hydrological model of the Fairfield-Suisun Valley Groundwater Basin.
- Evaluating MAR opportunities across Solano County.
- Investigating septic system impacts on groundwater quality.

4.4 Policy Implementation & Updates

4.4.1 Review & Align Policies with Water Resource Goals

Solano County will review and update existing policies to integrate One Water principles. **Key policy updates include:**

- Ensuring new developments comply with sustainable water use and conservation measures.
- Updating General Plan, zoning, and permitting processes and creating development plans to encourage multi-benefit water projects.
- Developing incentives for water reuse, stormwater capture, and conservation.

4.4.2 Explore Policy Mechanisms for Expanded Services

Solano County will coordinate with partner agencies to explore policy adjustments to enable expanded water and wastewater services in areas facing water access or quality challenges. **Key actions may include:**

- Assessing options for extending municipal water and wastewater services.
- Identifying potential service boundary modifications to accommodate future growth.
- Evaluating feasibility of regional wastewater treatment expansions[30].

[30] Mechanisms for expanded service are dependent on what area is desired to be served, how many customers to be served, land uses/discharger types, whether customers within that area are being compelled to connect to the sewer system or not, and how the infrastructure improvements will be financed. FSSD's legislatively-defined boundary cannot be adjusted with local policy, but there are

4.5 Public Engagement & Education

4.5.1 Developing Stakeholder Engagement Plan

The development and implementation of a Stakeholder Engagement Plan (SEP) will be led by Solano County, in collaboration with key stakeholders. This collaborative approach ensures that the SEP is tailored to the project's specific needs and fosters a sense of ownership among participants. The SEP will encompass the following key components:

- **Stakeholder Identification**: Compile a comprehensive list of all stakeholders, including individuals, groups, or organizations that may be affected by or have an interest in the projects. This process ensures that all relevant parties are considered and engaged appropriately.

Stakeholder Analysis: Assess each stakeholder's level of interest, influence, and potential impact on the project. This analysis aids in prioritizing engagement efforts and tailoring communication strategies to meet the specific needs of each stakeholder group.

Engagement Strategies: Develop tailored approaches for engaging different stakeholder groups. Strategies may include regular updates, consultation meetings, workshops, or collaborative decision-making sessions, depending on the stakeholders' preferences and the project's requirements.

Communication Plan: Establish clear communication channels and protocols to ensure timely and effective information dissemination. This plan will outline the frequency, methods, and content of communications to keep stakeholders informed and involved throughout the project lifecycle including digital engagement via GIS dashboards, newsletters, and online forums.

Feedback Mechanisms: Implement systems to gather input from stakeholders, allowing for continuous improvement and adaptation of project plans. Feedback mechanisms ensure that stakeholders' concerns and suggestions are heard and addressed promptly.

Monitoring and Evaluation: Regularly assess the effectiveness of engagement activities and make necessary adjustments. This component ensures that the SEP remains responsive to stakeholders' needs and contributes to the project's overall success.

4.5.2 Advancing Public Education on Water Conservation & Resilience

Educational programs will focus on:

- Water conservation techniques for urban and agricultural users.
- The benefits of integrated flood management.

potential mechanisms that require detailed discussions with FSSD/Solano County/LAFCO to accomplish an expansion and will depend on the answers to the questions above. (FSSD, 2025)

- Septic system maintenance and groundwater protection.

4.6 Strategizing Funding Approaches for Implementation

A comprehensive funding plan will be developed to support implementation actions which may draw from:

- **State & Federal Grants**: SWRCB, EPA, FEMA, USDA.
- **Local Funding Mechanisms**: Utility rate adjustments, public-private partnerships.
- **Bond Financing**: Revenue bonds for large-scale infrastructure projects.

4.7 Implementing Adaptive Management & Ongoing Evaluation

An adaptive management framework will be established to track progress, refine strategies, and ensure long-term success. Key actions include:

- Establishing Key Performance Indicators (KPIs) to measure project success.
- Conducting annual progress reviews.
- Integrating new scientific data and climate projections to refine strategies.

4.8 Conclusion & Next Steps

This structured approach provides a mechanism to achieving the One Water Framework goals. By aligning policy, data, partnerships, and funding strategies, Solano County can advance sustainable, multi-benefit water resource management. The next steps include:

- Finalizing agreements with key partners.
- Launching pilot studies and data collection efforts.
- Identify infrastructure improvements and funding opportunities.
- Securing initial funding for infrastructure investments.

This structured roadmap will ensure that the Water Resources component to a Utilities Master Plan is developed with scientific, policy, and financial rigor, leading to a more resilient and sustainable Solano County water system. Appendix F contains a summary of the implementation actions outlined above, mapped to the corresponding goals and strategies outlined in Section 3.

Section 5: Conceptual Projects

5.1 Overview of Conceptual Projects to Meet Regional Challenges

This section provides a summary of three conceptual projects and associated actions Solano County, and partners can consider addressing challenges identified in Section 2, and achieve the goals described in Section 3. The three conceptual projects described in this section are not exhaustive but serve as examples of practical implementation actions utilizing the One Water approach to meet multiple objectives in the unincorporated area and which could be pursued in developing the County's Water Resources component of a Utilities Master Plan.

- Concept Project #1 – Westside Waterway Maintenance and Streamlined Permitting
- Concept Project #2 – Regional Coordination for Eastside Drainage and Flood Control Management
- Concept Project #3 – Green Valley/Suisun Valley Water and Wastewater Assessment Study

5.2 Conceptual Projects

The following three conceptual projects address high-priority challenges identified by the Steering Committee and can be applied in different or expanded in larger areas, as needed.

Associated actions to implement each project are described in Section 4 under four general categories, including:

- Partnerships & Agreements – Strengthening coordination among agencies and stakeholders.
- Data Collection, Analysis & Synthesis – Enhancing data availability and management for informed decision making.
- Policy Implementation & Updates – Aligning policies with integrated water resource strategies.
- Public Engagement & Education – Increasing community involvement and awareness.

5.2.1 Project #1: Westside Waterway Maintenance and Streamlined Permitting

This project proposes development of a streamlined permitting strategy to facilitate coordinated creek clearing and maintenance to minimize localized flooding in the Westside of Solano County, under the portion of the unincorporated area under the jurisdiction of the San Francisco Water Quality Control Board (see Figure 1-1). Waterways refers to both channels which are part of the Green Valley Flood Control Project, managed by the SCWA, and natural waterways on private land. The streamlined permitting strategy will help facilitate waterway management on

private lands by either reducing the administrative burden on landowners to apply of permits and/or providing a programmatic permit any private landowner can use to help manage priority waterways to reduce localized flooding.

Key Project Goals:

- Identify high-priority flood zones for creek clearing permit consideration.
- Develop a streamlined permitting strategy to simplify waterway clearing and maintenance.

5.2.1.1 Background

Recent flood events in the Westside waterway have revealed significant debris buildup, which obstructs drainage and exacerbates localized flooding. During these events, stormwater overflows into designated channels, causing soil erosion and damage to private property. Jursidictional responsibilities and channel ownership are often unclear, with culvert in incorporated areas backing up and causing flooding in unincorporated area, and vice versa. Suisun Creek, Ledgewood Creek, and Dan Wilson Creek were identified as key contributors to localized flooding due to heavy vegetation growth. The Solano County Agricultural Commissioner also received multiple complaints regarding crop damage resulting from poor drainage and localized flooding. These waterways are mostly natural waterways or manmade channels which drain from private property, but more study is needed to determine the extent of the drainage system.

Napa County has a Stream and Watershed Maintenance program that utilizes long-term programmatic permits from the applicable trustee agencies. Program actions are only undertaken by the trustee agencies (Napa County Flood Control and Water Conservation District, Napa County Public Works Department, or the Napa County Resource Conservation District). The Napa County Flood Control and Water Conservation District performs creek clearance on private property upon request and as part of public safety.

5.2.1.2 Existing Responsibility

Currently, no single public agency is responsible for comprehensive maintenance of the Westside waterways, many of which lie on private land. SCWA maintains the Green Valley Flood Control Project, which drains the Cordelia area via man-made channels that connect upper watershed areas and city of Fairfield to the Suisun Marsh (described in Section 2). Caltrans maintains the bridges and culverts under Interstate 80 and Interstate 680. However, the remaining waterways primarily fall under private ownership, with limited assistance available from organizations like the Solano RCD and Suisun RCD. These districts provide technical assistance[31] with drainage improvement projects and permit assistance.

While Solano County is not responsible for maintenance of natural waterways on private land, the Solano County General Plan Implementation Action HS 1-4 states “Require periodic stream

[31] Solano RCD’s flood awareness manual, *Ready for Flood*, documents permits needed for maintenance. Suisun RCD maintains dredging permits for parts of Cordelia Slough.

maintenance by private property owners and undertake regular stream maintenance by the appropriate public agencies."

5.2.1.3 Regional Challenges and Goals Addressed

Conceptual Project #1 - Westside Waterway Maintenance and Streamlined Permitting addresses regional challenges related to the complex creek clearing permitting process and coordination, as described in Section 2.3.1 - "Clarify Coordinated Drainage/Flood Management Responsibilities".

This project also addresses the following One Water goals:

- **Goal 2**: Develop Governance Structures to Support Regional Water Resources Management Through Interagency Collaboration and Partnership"
- **Goal 4**: Improve Localized Drainage, Flood Protection, and Wastewater Management.

5.2.1.4 Recommended Actions

To create an effective, coordinated permitting strategy, Solano County should leverage existing efforts by the RCDs while engaging with private landowners. Specific actions include:

Partnership/Agreement/MOU

The permitting strategy will be developed through coordinated efforts between County, SCWA, resource agencies, and other relevant entities to:

- Define the geographic scope and coverage of a programmatic general permit for waterway maintenance, including determining the appropriate permit holder.
- Evaluate funding opportunities including developing a cost-share program.
- Establish agreements with relevant agencies to clarify responsibilities and streamline permitting.

Data Review, Compilation, Analysis, and Synthesis

The specific actions to map and prioritize maintenance of Westside waterways include:

- Identify and map Westside waterways which are not the responsibility of either SCWA's Green Valley Flood Control Project, Caltrans, or others
- Develop criteria and prioritize waterway management based on severity of localized flooding, including damage to roadways, private property, or crop loss
- Identify landowners adjacent to priority waterways
- Collect data on local natural communities and species habitat to support environmentally responsible maintenance techniques
- Secure agreements with landowners in priority waterways, and

- Review priorities and data with interested parties and integrate feedback into the planning process.

The streamlined permitting strategy efforts for priority waterways will include:

- Assess options for streamlining the permitting process, such as incorporating maintenance activities into a local Habitat Conservation Plan (formal 30 or 50-year Endangered Species Act permits that cover specified activities).
- Identify the agency best suited to hold and manage the permit.
- Develop and document approved waterway management techniques for permitting.
- Complete and submit the necessary applications for a regional or programmatic general permit to the appropriate permitting agencies.

Public Education and Outreach

- Engage with local landowners to gather input for prioritizing waterways, shaping the permitting strategy.
- Partner with SCWA, local RCDs and other stakeholders to implement an outreach plan that includes training programs on streamlined permitting process.

5.2.2 Conceptual Project #2 – Regional Coordination and Planning of Eastside Drainage and Flood Control Management with Multi-Benefit Projects

Conceptual Project #2 is to improve coordination among water, drainage, and flood agencies to develop multi-benefit projects through regional planning and leveraging the existing coordination entities to address persistent drainage and flood issues within the Eastside Solano County (Figure 1-1). By understanding drainage and flood risks at a watershed-level scale and leveraging strategies such as MAR, Conceptual Project #2 will provide multiple benefits for flood mitigation and groundwater replenishment with improved coordination efforts for collaboration and decision-making.

Key Project Goals:

- Formalize responsibilities and funding through agreements for improved interagency coordination.
- Develop an integrated, regional approach to drainage and flood management.
- Leverage flood management efforts to enhance groundwater recharge.

5.2.2.1 Background

Eastside Solano County, particularly the Dixon and Elmira Maine Prairie Agricultural Areas, faces significant drainage and flooding challenges due to fragmented flood management jurisdictions and outdated infrastructure. These problems are further exacerbated by increasing urbanization or development in the region and increased stormwater flows with changing

climate. While the Dixon Regional Watershed JPA has implemented drainage and flood management initiatives[32] within its designated area, a broader, coordinated watershed-based strategy is urgently needed to address regional flooding impacts.

5.2.2.2 Existing Responsibility

Several local agencies manage drainage and flood control infrastructure across Eastside Solano County areas including the Ulatis Project for flood control operated by SCWA and other drainage facilities operated by Maine Prairie WD, Dixon RCD, SID, and RD 2068. However, these facilities have geographic gaps between coverage areas and were designed for different purposes. For example, the Ulatis Project operated by SCWA is intended for flood control, handling 10-year and 100-year storm events depending on the location, while other systems primarily convey localized stormwater and irrigation runoff. Whereas the GSA Collaborative manages groundwater resources as part of the Solano Subbasin in the Eastern Solano County, including interconnected surface water and groundwater and potential projects or actions for groundwater recharge.

5.2.2.3 Regional Challenges and Goals Addressed

Conceptual Project #2 addresses several regional challenges outlined in Section 2 including fragmented flood management responsibilities, outdated infrastructure and hydrological models, and declining groundwater levels.

This project aligns with the following One Water goals:

- **Goal 2**: Develop Governance Structures to Support Regional Water Resources Management through Interagency Collaboration and Partnership
- **Goal 3:** Enhance Local Sustainable Water Supply and its Reliability and Climate Change Resiliency
- **Goal 4**: Improve localized drainage, flood protection, and wastewater management.
- **Goal 5**: Implement multi-benefit strategies through the integration of water resources.

5.2.2.4 Recommended Actions

The following specific actions are recommended to achieve the project goals:

Partnership Agreements

Establish agreements with key agencies such as; Solano County, SCWA, JPA, GSA Collaborative and other local jurisdictions to:

- Define roles, responsibilities, and decision-making processes for multi-benefit flood and groundwater recharge, and

[32] JPA has implemented key projects in the region, including development of the 2001 Dixon Watershed Management Plan (DWMP) and the construction of the Pond A/Lateral 1 and Pond C improvements and Pond C in 2004 and 2007, respectively.

- Initiate projects and track progress.

Data Review, Compilation, Analysis, and Synthesis

Comprehensive data collection and analysis are critical to informing integrated multi-benefit solutions. Solano County, in coordination with SCWA and other agencies, will:

- Develop standardized data management protocols to streamline information collection.
- Collaborate with universities and research institutions to ensure accurate and reliable data.
- Document past flood events, including causes, impacts, and mitigation outcomes.
- Map hydrologic boundaries, drainage infrastructure, and jurisdictional responsibilities.
- Evaluate groundwater recharge potential in key areas such as the Northwest Focus Area of the Solano Subbasin.

- The GSAs collaborate with growers through GSP implementation to establish cover crop pilot studies. These studies aim to assess the benefits of cover crops and other practices for improving soil health and reducing surface runoff and erosion during storm events while enhancing groundwater recharge.
- SCWA is coordinating with the JPA to complete the various phases of studies included the DWMP.

- Update and expand existing hydrological and hydraulic models to reflect current and projected future conditions
- Identify data gaps and establish plans for data collection.

Policy Implementation and Update

Key policy actions include:

- Review and update local policies to align with regional, State, and federal flood and groundwater management regulations, as needed.
- Develop incentives for landowners to adopt groundwater recharge practices.
- Integrate policies that promote multi-benefit management solutions.

Public Education and Outreach

- Develop a comprehensive outreach plan to engage stakeholders and community members.
- Educate landowners about the benefits and techniques of groundwater recharge.
- Organize workshops and training sessions to demonstrate practical recharge practices.
- Collaborate with agricultural organizations to promote best practices.

5.2.3 Conceptual Project #3 – Green Valley/Suisun Valley Westside Water and Wastewater Assessment Study

Conceptual Project #3 includes evaluating current and future water and wastewater demands and assess availability of water resources infrastructure in the Green and Suisun Valley areas to support agriculture and economic growth. The assessment will specifically target ongoing and emerging challenges in these areas including the extent of saltwater intrusion in the groundwater basin and other water quality risks associated with individual septic systems for commercial use including agriculture processing (Figure 2-6 & 2-8).

Key Project Goals:

- Quantify the availability of groundwater and surface water resources to meet future demands
- Assess wastewater treatment and disposal methods for expanding agricultural development.
- Develop integrated water supply and wastewater management strategies and assess infrastructure needs.

5.2.3.1 Background

The Green Valley and Suisun Valley regions are experiencing increased water demand due to agricultural, tourism, and economic expansion. The Green Valley Agricultural Area, as indicated in the Middle Green Valley Specific Plan, anticipates residential growth. The Suisun Valley, identified in the County's General Plan as a key location for agricultural tourism and wine production, is similarly expected to grow. To support this growth and economic development, a comprehensive water and wastewater assessment study is needed to evaluate current conditions, forecast future demands, and identify infrastructure requirements.

5.2.3.2 Existing Responsibility

The Green Valley region receives irrigation water from the SID, while potable water is provided in some areas by the City of Vallejo's Lakes Water System (LWS) or individual wells. In Suisun Valley, water is supplied by the Suisun-Solano Water Authority (SSWA), LWS, and through groundwater wells. The Fairfield-Suisun Valley Groundwater Basin serves as a groundwater resource for both valleys, through its long-term capacity and water quality remain uncertain. For both the Green and Suisun Valleys, domestic and industrial wastewater is disposed through individual septic systems and leach fields via land application. Process wastewater is required to meet additional permit requirements for onsite disposal otherwise required to be hauled offsite for disposal.

The FSSD service area borders the southern ends of both Suisun and Green Valleys and provides advanced secondary treatment of wastewater generated from domestic, commercial, and industrial sources within the city boundaries of Fairfield and Suisun City. However, some unincorporated parcels are served by the FSSD[33] or have inadequate or failed septic systems

[33] Agreement to provide disposal of Sewage, May 13, 2003 between Fairfield-Suisun Sewer District and Solano County and FSSD Act, August 1, 2020.

and requested to be served by FSSD. The parcels served by FSSD are shown on Figure 2-8. FSSD's Board of Directors requested that the County provide a comprehensive sewer study of all parcels that are requesting sewer service, land uses and anticipated wastewater generation, potential sewer configurations, and potential funding mechanisms, before the Board will consider whether to provide additional out-of-agency sewer service[34]. To facilitate expedient implementation of County goals, and to minimize disruption to the community, a similar evaluation of water and drainage needs can be conducted at the same time to ensure that infrastructure construction can be coordinated, and all needed services can be provided.

In general, to meet increased water and wastewater demand and support economic growth, coordination with the various water suppliers and upgraded infrastructure is needed in both valleys.

5.2.3.3 Regional Challenges and Goals Addressed

Conceptual Project #3 – Green Valley/Suisun Valley Westside Water and Wastewater Assessment Study addresses several regional water resource challenges summarized in Section 2, including water supply limitations, groundwater contamination from septic systems, and saltwater intrusion risks.

This project aligns with the following One Water Framework goals:

- **Goal 1:** Support implementation of the Solano County General Plan
- **Goal 2**: Enhance local sustainable water supply and climate resiliency.
- **Goal 4**: Improve localized drainage, flood projection, and wastewater management
- **Goal 5**: Implement multi-benefit strategies through integrated water resources management.

5.2.3.4 Recommended Actions

To address these challenges, Solano County should implement the following actions:

Partnership Agreements

- Solano County will coordinate with key partners such as SID, Cities of Fairfield and Vallejo, Fairfield-Suisun Sewer District, and through organizations such as the Solano Water Advisory Commission, Solano County Drought Taskforce, and Solano Bayshore Resiliency Roundtable.
- Establish agreements to facilitate water and wastewater infrastructure development.
- Collaborate with existing organizations to ensure effective implementation of the studies. Depending on the selected infrastructure approach, formal agreements may be necessary to extend water and sewer services.

[34] Solano County Board of Supervisor Meeting Agenda #23, July 22, 2025

Data Review, Compilation, Analysis, and Synthesis

Solano County will lead data collection and analysis efforts in collaboration with local agencies and academic institutions. Actions include:

Data Review/Compilation

- Develop data management protocols to ensure accurate and consistent information.
- Review historical hydrologic data and existing studies.
- Compile a GIS-based inventory of water and wastewater infrastructure.
- Identify data gaps related to groundwater availability, water quality, and wastewater management.

Hydrogeological Conceptual Model Development

The development of a hydrogeological model of the Fairfield-Suisun Valley Basin is critical to defining the groundwater characterization and water budget of existing water supplies and projected demands.

- Define basin settings, boundaries and geological formations.
- Assess aquifer properties such as transmissivity, storativity, and hydraulic conductivity.
- Identify recharge and discharge areas.
- Develop a water budget based on historical, current, and projected demand.
- Evaluate groundwater quality and assess the risk of saltwater intrusion.

Wastewater Treatment and Disposal Analysis

Solano County and its partners will conduct a comprehensive evaluation of wastewater treatment and disposal approaches to address future projected demands. The findings will guide the Master Plan by evaluating infrastructure feasibility and sustainability for future demands.

- Review the performance of existing septic systems including age and condition of existing septic system and existing land uses. Identify known or documented environmental and groundwater impacts of wastewater discharges including agricultural runoff and winery process water, or failed septic systems.
- Project future wastewater treatment needs based on proposed projects and land use trends.
- Identify potential sites for centralized wastewater treatment or service extensions to existing centralized treatment system.

Infrastructure Alternatives Analysis

- Identify existing water supply and wastewater infrastructure.

- Develop alternatives for expanding or upgrading infrastructure.
- Evaluate the feasibility of integrating new systems with existing networks.
- Collaborate with utility providers (SID, City of Vallejo, City of Fairfield, Fairfield-Suisun Sewer District and others) to develop agreements or amendments for service expansion.
- Coordinate with utility providers and key stakeholder on strategies to fund initial capital improvements and ongoing operations and maintenance.

Policy Implementation and Updates

Review and revise policies to support water and wastewater infrastructure development.

- Align local policies with State regulations.
- Develop incentives for water reuse, small water system consolidations, and septic system upgrades.

Public Education and Outreach

Solano County will develop a detailed outreach plan to engage interested parties and gather input.

- Develop an outreach plan to communicate project goals and findings.
- Conduct surveys to gather input on septic system performance and water quality.
- Educate landowners on potential infrastructure improvements and benefits.

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Appendix A: Inventory of Past Plans and Reports

Plan/Study	Geography Covered
Solano Subbasin Groundwater Sustainability Plan	Solano Valley Groundwater Basin, and area that underlies the cities of Vacaville, Dixon, and Rio Vista as well as the eastern portion of unincorporated Solano County.
Projects	
Dixon Northeast Quadrant Detention Basin	Improvements to Solano Project Facilities
Detention basin north of Interstate-80	NBA Infrastructure and Capacity Improvements
Dixon Detention Pond A Operation	North Bay Aqueduct Alternate Intake Project
Dixon Detention Pond B Operation	Improve Solano Project SCADA infrastructure
Dixon Detention Pond C Operation	Delta levee restoration
City of Vacaville Detention Basins	Regional Capital Improvement Plan
Install additional regulating reservoirs in SID and Maine Prairie Water District	Ulatis Project 1, convey water away from Maine Prarie Water District Dam #3
Install additional canal automation in SID and Maine Prairie Water District	Ulatis Project 2, convey water away from Maine Prairie Water District Dam #2
Expand City of Vacaville surface water treatment and conveyance	Ulatis Project 3, convey water away from Maine Prairie Water District Dam #1
Grower education on Sustainable Groundwater Management	Ulatis Project 4, redistribute drain water west of SID Brown-Alamo Recovery Dam
Install additional canal automation in SID and Maine Prairie Water District	Ulatis Project 5, Move water above SID McCune-Sweeny Recovery Dam
City of Vacaville recycled water pipelines	Regional Invasive Mussels Management Plan
Install additional regulating reservoirs in SID and Maine Prairie Water District	City of Vacaville Water Master Plan (on-going)
Groundwater recharge project in Northwest focus area	Regional Invasive Mussels Management Plan
Expand City of Vacaville surface water treatment and conveyance	Lake Solano Project 1, stabilization of groundwater in Lake Solano Project area to create robust groundwater supply for Quail Canyon Public Water System
Managed aquifer recharge on local farms	Dixon Recycled Water Use
On farm groundwater recharge along Ulatis Creek	City of Vacaville recycled water pipelines
Westside Sacramento Integrated Regional Water Management Plan	Eastern side of Solano County including cities of Vacaville, Dixon, and Rio Vista.
Projects	
Research on improving water treatment for Delta sources	Dixon Main Drain/V-Drain enlargement
Aquatic nuisance vegetation management	Eastside drain in Dixon area
Gibson Canyon Creek detention basin	Storm flow reduction from ag lands north of I-80

Plan/Study	Geography Covered
Dixon Watershed Management Plan	Dixon Resource Conservation District, Reclamation District 2068, Maine Prairie Water District and the City of Dixon
Projects	
Drainage alternatives for the City of Dixon Northeast Quadrant	
Solano County Water Agency Flood Control Master Plan	Solano County
Projects	
Ulatis Flood Control Model Project	Local Watershed Management Plan - Dixon
Local Watershed Management Plan - Yolo Bypass	Local Watershed Management Plan - Sulphur Springs Creek
Local Watershed Management Plan - Putah Creek	Local Watershed Management Plan - Homeacres
Local Watershed Management Plan - Barker Slough	
City of Benecia 5-Year Capital Improvement Plan 2019-2024	City of Benicia
Projects	
Water Reuse Project	
City of Dixon 2020 Urban Water Management Plan	City of Dixon water service area
Projects	
Construction up to 5 new wells	Wastewater Treatment Facility Expansion
City of Dixon 5-Year Capital Improvement Plan 2024 through 2028	City of Dixon
Projects	
Expansion of sewer services Northeast quadrant	Chromium 6 Pilot Study
DRCD Outfall Improvements	Southwest Area Drainage
South Almod Area Drainage Improvements	Eastside Drainage Project
Core Area Drainage Rehabilitation Project	
City of Rio Vista 2020 Urban Water Management Plan	City of Rio Vista
Projects	
North Bay Recharge Aqueduct Project (joint project with Solano County Water Agency)	9 new wells to meet future demand

Plan/Study	Geography Covered
City of Vacaville Recycled Water Master Plan	City of Vacaville
Projects	
Recycled water delivery to landscape irrigation	Recycled water delivery for cooling tower and boiler use
City of Vacaville 5-Year Capital Improvement Plan	City of Vacaville
Projects	
Repairs to Alamo and Ulatis Creek Banks	Alamo Creek Detention Basin
Upsizing of transmission lines to accommodate future growth	Downtown Specific Plan area sewer upgrade
Solano Irrigation District - Gibson Canyon Improvement District Alternate Source Study	Gibson Canyon Improvement District
Projects	
Increase storage in Gibson Canyon system by 1.2 MG	
Rural North Vacaville Water District 8 Year Capital Improvement Plan	North Vacaville area, including Cantelow Road, English Hills, Gibson Canyon, and Steiger Hill
Projects	
Arsenic Treatment System	

Appendix B: Sustainable Groundwater Management Act Information

Specific changes to California Government Code resulting from SGMA are summarized below:

- **California Govt Code Section 65350.5. Review and Consideration of Groundwater Requirements**

Before the adoption or any substantial amendment of a city's or county's general plan, the planning agency shall review and consider all of the following:

(a) An adoption of, or update to, a groundwater sustainability plan or groundwater management plan pursuant to Part 2.74 (commencing with Section 10720) or Part 2.75 (commencing with Section 10750) of Division 6 of the Water Code or groundwater management court order, judgment, or decree.

(b) An adjudication of water rights.

(c) An order or interim plan by the State Water Resources Control Board pursuant to Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6 of the Water Code.

- **California Government Code Section 65352. Referral of Proposed General Plan Updates to Other Agencies**

(a) Before a legislative body takes action to adopt or substantially amend a general plan, the planning agency shall refer the proposed action to all of the following entities:

(7) A public water system, as defined in Section 116275 of the Health and Safety Code, with 3,000 or more service connections, which serves water to customers within the area covered by the proposal. The public water system shall have at least 45 days to comment on the proposed plan, in accordance with subdivision (b), and to provide the planning agency with the information set forth in Section 65352.5.

(8) Any groundwater sustainability agency that has adopted a groundwater sustainability plan pursuant to Part 2.74 (commencing with Section 10720) of Division 6 of the Water Code or local agency that otherwise manages groundwater pursuant to other provisions of law or a court order, judgment, or decree within the planning area of the proposed general plan.

(9) The State Water Resources Control Board, if it has adopted an interim plan pursuant to Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6 of the Water Code that includes territory within the planning area of the proposed general plan.

(10) The Bay Area Air Quality Management District for a proposed action within the boundaries of the district.

(11) A California Native American tribe that is on the contact list maintained by the Native American Heritage Commission and that has traditional lands located within the city's or county's jurisdiction.

(12) The Central Valley Flood Protection Board for a proposed action within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code.

- **California Government Code Section 65352.5. Requirement to Provide Water Related Documents to General Plan Agency**

(a) The Legislature finds and declares that it is vital that there be close coordination and consultation between California's water supply or management agencies and California's land use approval agencies to ensure that proper water supply and management planning occurs to accommodate projects that will result in increased demands on water supplies or impact water resource management.

(b) It is, therefore, the intent of the Legislature to provide a standardized process for determining the adequacy of existing and planned future water supplies to meet existing and planned future demands on these water supplies and the impact of land use decisions on the management of California's water supply resources.

(c) Upon receiving, pursuant to Section 65352, notification of a city's or a county's proposed action to adopt or substantially amend a general plan, a public water system, as defined in Section 116275 of the Health and Safety Code, with 3,000 or more service connections, shall provide the planning agency with the following information, as is appropriate and relevant:

(1) The current version of its urban water management plan, adopted pursuant to Part 2.6 (commencing with Section 10610) of Division 6 of the Water Code.

(2) The current version of its capital improvement program or plan, as reported pursuant to Section 31144.73 of the Water Code.

(3) A description of the source or sources of the total water supply currently available to the water supplier by water right or contract, taking into account historical data concerning wet, normal, and dry runoff years.

(4) A description of the quantity of surface water that was purveyed by the water supplier in each of the previous five years.

(5) A description of the quantity of groundwater that was purveyed by the water supplier in each of the previous five years.

(6) A description of all proposed additional sources of water supplies for the water supplier, including the estimated dates by which these additional sources should be available and the quantities of additional water supplies that are being proposed.

(7) A description of the total number of customers currently served by the water supplier, as identified by the following categories and by the amount of water served to each category:

(A) Agricultural users.

(B) Commercial users.

(C) Industrial users.

(D) Residential users.

(8) Quantification of the expected reduction in total water demand, identified by each customer category set forth in paragraph (7), associated with future implementation of water use reduction measures identified in the water supplier's urban water management plan.

(9) Any additional information that is relevant to determining the adequacy of existing and planned future water supplies to meet existing and planned future demands on these water supplies.

(d) Upon receiving, pursuant to Section 65352, notification of a city's or a county's proposed action to adopt or substantially amend a general plan, a groundwater sustainability agency, as defined in Section 10721 of the Water Code, or an entity that submits an alternative under Section 10733.6 shall provide the planning agency with the following information, as is appropriate and relevant:

(1) The current version of its groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720) of Division 6 of the Water Code.

(2) If the groundwater sustainability agency manages groundwater pursuant to a court order, judgment, decree, or agreement among affected water rights holders, or if the State Water Resources Control Board has adopted an interim plan pursuant to Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6 of the Water Code, the groundwater sustainability agency shall provide the planning agency with maps of recharge basins and percolation ponds, extraction limitations, and other relevant information, or the court order, judgment, or decree. Sustainable Groundwater Management Act, and related provisions (as chaptered) Page 6 As Effective January 1, 2016 [rev. 1/15/2016]

(3) A report on the anticipated effect of proposed action to adopt or substantially amend a general plan on implementation of a groundwater sustainability plan pursuant to Part 2.74 (commencing with Section 10720) of Division 6 of the Water Code.

Appendix C: Summary of Applicable Solano County General Plan Goals, Policies and Programs Related to Water Resources

General Plan Goal, Policy or Program #	Goal, Policy, or Program
General Land Use Policies Affecting Provision of Services	
Agricultural Policy AG.P-1 (applies to lands designated Agriculture)	Ensure that agricultural parcels are maintained at a sufficient minimum parcel size to remain a farmable unit. Farmable units are defined as the size of parcels a farmer would consider viable for leasing or purchasing for different agricultural purposes. A farmable unit is not considered the sole economic function that will internally support a farm household.
Agricultural Policy AG.P-2 (applies to lands designated Agriculture)	Ensure that residential development is compatible with surrounding agricultural activities.
Agricultural Policy AG.P-4 (applies to lands designated Agriculture)	Require farmland conversion mitigation for either of the following actions: A General Plan amendment that changes the designation of any land from an agricultural to a non-agricultural use or; An application for a development permit that changes the use of land from production agriculture to nonagricultural use, regardless of General Plan designation.
Agricultural Policy AG.P-8 (applies to lands designated Agriculture)	Maintain water resource quality and quantity for the irrigation of productive farmland to prevent the loss of agriculture related to competition from urban water consumption internal or external to the county.
Agricultural Policy AG.P-9 (applies to lands designated Agriculture)	Promote efficient management and use of agricultural water resources.
Agricultural Policy AG.P-10 (applies to lands designated Agriculture)	Support efforts by irrigation districts and others to expand the county's irrigated agricultural areas where appropriate.
Agricultural Policy AG.P-15 (applies to lands designated Agriculture)	Permit limited agricultural service uses that support local agricultural activities and are not harmful to the long-term agricultural use in the surrounding area. These support services should be located in areas designated Limited Industrial and Agriculture as depicted on the Land Use Diagram.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Agricultural Policy AG.P-32 (applies to lands designated Agriculture)	Lands within the "Agriculture" designation shown on the Land Use Diagram may be redesignated to a more intensive agricultural designation, or to rural residential designation (with a minimum density of one unit per 2.5 to 10 acres) if the Board of Supervisors makes each of the following findings: (a) that the approval will not constitute part of, or encourage, a piece-meal conversion of a larger agricultural area to residential or other non-agricultural uses and will not alter the stability of land use patterns in the area; (b) that no land proposed for redesignation is prime agricultural land as defined pursuant to California Government Code Section 1201 (the California Land Conservation Act of 1965, also known as the Williamson Act); (c) that the subject land is unsuitable for agriculture due to terrain, adverse soil conditions, drainage, flooding, parcel size, or other physical factors, such that it has no substantial market or rental value under the "Agriculture" designation; (d) that the use and density proposed are compatible with agricultural uses and will not interfere with accepted farming practices; (e) that the land is immediately adjacent to existing comparably developed areas and the applicant for the redesignation has provided substantial evidence that the Fire District, School District, County Sheriff, the area road system, and the proposed water supplier have adequate capacity to accommodate the development and provide it with adequate public services; and (f) that annexation to a city or incorporation is not appropriate or possible based on the following factors: nearby cities designated sphere of influence boundaries, cities' general plan growth limits and projections, and comprehensive annexation plans.
Agricultural Program AG.I-23	Work with Solano County Water Agency, irrigation districts, reclamation districts, adjacent counties and resource conservation districts to ensure adequate future water supply and delivery. Examine agricultural trends in surrounding communities and cooperate with adjacent counties in marketing and agricultural preservation practices. Review development proposals and require necessary studies as appropriate, and water conservation and mitigation measures to ensure adequate water service. Examine the potential impact of water transfers from farmland to urban uses internal or external to the county and the implications for agriculture in the county…Explore options for expanding the county's irrigated areas. Working with the Solano County Water Agency, irrigation districts, reclamation districts, and the resource conservation district, promote sustainable management and efficient use of agricultural water resources.
Public Facilities Goal PF.G-1	Provide adequate public services and facilities to accommodate the level of development planned by the County.
Public Facilities Goal PF.G-2	Ensure that residents throughout Solano County have access to essential public facilities and services.
Public Facilities Policy PF.P-1	Provide public facilities and services essential for health, safety, and welfare in locations to serve local needs.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Public Facilities Policy PF.P-2	Require new development and redevelopment to pay its fair share of infrastructure and public service costs.
Public Facilities Policy PF.P-4	Ensure that adequate land is set aside within the unincorporated county for public facilities to support future needs.
Public Facilities Policy PF.P-5	Design and locate new development to maximize the use of existing facilities and services and to coordinate with the cities the need for additional County services.
Public Facilities Policy PF.P-6	Guide development requiring urban services to locations within and adjacent to cities.
Public Facilities Regulation PF.I-1	Use the County's Capital Improvement Program to identify, plan, and provide for future public facilities and improvements. Capital Improvement Program projects shall be reviewed annually for consistency with General Plan policies and coordinated with current and future development.
Water Facilities and Service	
Public Facilities Policy PR.P-9	Actively support efforts of the Solano County Water Agency, water districts, and regional water suppliers and distributors, to ensure that adequate high-quality water supplies are available to support current and future development projects in Solano County.
Public Facilities Policy PR.P-10	Maintain an adequate water supply by promoting water conservation and development of additional cost-effective water sources that do not result in environmental damage.
Public Facilities Policy PF.P-11	Promote and model practices to improve the efficiency of water use, including the use of water-efficient landscaping, beneficial reuse of treated wastewater, rainwater harvesting, and water-conserving appliances and plumbing fixtures.
Public Facilities Policy PF.P-13	Support efforts by irrigation districts and others to expand Solano County's irrigated agricultural areas.
Public Facilities Policy PF.P-14	In areas identified with marginal water supplies, require appropriate evidence of adequate water supply and recharge to support proposed development and water recharge.
Public Facilities Policy PF.P-15	Domestic water for rural development shall be provided through the use of on-site individual wells or through public water service.
Public Facilities Policy PF.P-16	Provide and manage public water service through public water agencies.
Public Facilities Policy PF.P-17	Limit public water infrastructure to developed areas or those designated for future development to prevent growth-inducing impacts on adjoining agricultural or open space lands.
Public Facilities Policy PF.P-18 Also related to wastewater	The minimum lot size for properties to be served by individual on site wells and individual on-site sewage disposal systems shall be five acres. Where cluster development is proposed with on-site wells and sewage disposal systems, parcels may vary in size provided the overall density of the project is not greater than five acres per parcel and that no individual parcel is less than one acre in size.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Public Facilities Policy PF.P-19 Also related to wastewater	The minimum lot size for properties to be served by public water service with individual on-site sewage disposal systems shall be 2.5 acres. Where cluster development is proposed with public water service and on-site sewage disposal systems, parcels may vary in size provided the overall density of the project is not greater 2.5 acres per parcel and that no individual parcel is less than one acre in size.
Public Facilities Policy PF.P-20	Minimize the consumption of water in all new development.
Public Facilities Program PF.I-7 Also related to wastewater	Maintain the Zoning Ordinance to specify minimum lot sizes for properties with on-site sewage and on-site wells.
Public Facilities Program PF.I-8	Implement the recommendations from the English Hills Specific Plan Groundwater investigation establishing minimum parcel sizes to ensure adequate groundwater supply and recharge for the English Hills area.
Public Facilities Program PF.I-9	Adopt ordinances that require the use of water-efficient landscaping, water-conserving appliances and plumbing fixtures.
Public Facilities Program PF.I-11	Continue to require preparation of water supply assessment pursuant to the California Water Code to analyze the ability of water supplies to meet the needs to regulated projects, in the context of existing and planned future water demands. Review the availability of water to serve new developments in the unincorporated area before permitting such developments and ensure that the approval of new developments will not have a substantial adverse impact on water supplies for existing water users.
Public Facilities Program PF.I-13	Require new development proposing on-site water supplies in areas identified with marginal water supplies to perform a hydrologic assessment to determine whether project plans meet the County's hydrologic standards.
Public Facilities Program PF.I-14	Review plans for new development project to ensure that they have provided for water on-site or through a public agency.
Public Facilities Program PF.I-15	Investigate the potential for innovative recycled water systems in Solano County, such as the use of greywater for domestic and agricultural purposes and identify sources of funding for implementation of these systems.
Health and Safety Program HS.I-25	Collaborate with fire districts to establish funding mechanisms, including impact fees to offset fire protection costs for new developments in areas of high wildfire risk.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
	Wastewater
Public Facilities Policy PF.P-21	Sewer services for development within the unincorporated area may be provided through private individual on-site sewage disposal systems, or centralized community treatment systems managed by a public agency utilizing the best systems available that meet tertiary treatment or higher standards. Use of such centralized sewage treatment systems shall be limited to: (1) existing developed areas, (2) areas designated for commercial or industrial uses, or (3) areas designated for rural residential development when part of a specific plan or policy plan overlay.
Public Facilities Policy PF.P-22	Ensure that new and existing septic systems and sewage treatment systems do not negatively affect groundwater quality.
Public Facilities Program PF.I-22	Review and revise the County Code to ensure it incorporates current best practices to minimize the impacts of on-site septic systems and sewage treatment systems.
Public Facilities Program PF.I-22	Require septic systems to be located outside of primary groundwater recharge areas, or where that is not possible, require shallow leaching systems for disposal of septic effluent. Require new septic systems or leach fields to be installed at least 100 feet away from natural waterways, including perennial or intermittent streams, seasonal water channels, and natural bodies of standing water. Make an exception for the repair of existing systems if the 100 feet setback area cannot be maintained and if adequate provisions are made for protecting water quality. Require the use of alternative wastewater treatment techniques to respond to site characteristics, as determined by the California Department of Health Services and Regional Water Quality Control Boards.
Public Facilities Program PF.I-24	On-site sewage disposal systems for individual lots and subdivisions may be operated by private property owners. A public agency shall manage a centralized community sewage disposal system. If lands proposed to be served by a community sewage disposal system are not within the boundaries or serve area of an existing public sewage treatment agency, the Board of Supervisors shall, as a condition of development, designate a public agency to provide and manage the public sewer service. Sewer treatment facilities shall be designated to provide sewer service to existing developed areas, areas designated for commercial or industrial uses, or areas designated for rural residential development when part of a specific plan or policy plan overlay. An analysis of the financial viability of construction, operating, and maintaining a proposed community sewage disposal system shall be required.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Public Facilities Program PF.I-35	Coordinate with the fire districts and CAL Fire during project review to ensure that all new development incorporates appropriate fire- safety techniques, including fire-safe building materials, early warning systems, adequate clear spaces and fuel reduction adequate escape routes and facilities, firebreaks, and sufficient water supply systems for fire suppression.
Stormwater Management and Drainage	
Resources Program RS.I-66	Establish development standards that maximize retention of runoff and regulate development to avoid pollution of stormwater, water bodies, and groundwater.
Resources Program RS.I-70	Require site plan elements to limit runoff from new development. These measures might include reduced pavement or site coverage, permeable pavement, vegetation that retains and filters stormwater, and/or drainage features. Limit the construction of extensive impermeable surface and promote the use of permeable materials for surfaces such as driveways, streets, parking lots, and sidewalks.
Resources Program RS.I-75	Together with Solano County Water Agency (SCWA) and the cities, create and maintain a comprehensive database of information regarding groundwater supply and quality. Seek funding to complete a countywide groundwater study that fills the gaps among acquire-specific studies. Coordinate with SCWA to get more information on its groundwater study and subsequent groundwater management programs.
Public Facilities Program PF.I-3	Review the County's current development fee schedule and revise it as necessary to ensure that the development fees reflect the facility improvements necessary to implement the General Plan and provide adequate levels of service. Storm drainage, roadways and transportation, parks, fire protection, law enforcement, libraries, and other fees should be considered.
Public Facilities Policy PF.P-32	Cooperate with the cities, Solano County Water Agency and other special districts to serve all areas in need of drainage improvements.
Public Facilities Policy PF.P-33	Require development projects to minimize pollution of stormwater, water bodies receiving runoff, and groundwater, and to maximize groundwater recharge potential by: implementing planning and engineering design standards that use low-impact development techniques and approaches to maintain and mimic the natural hydrologic regime; using infiltration style low-impact development technologies; and following stormwater best management practices during and after construction. In accordance with relevant state-required stormwater permits.
Public Facilities Policy PF.P-34	Control the rate and dispersal of runoff from developments through the use of detention and retention basins, appropriate landscaping, minimal use of impervious surfaces, and other storm water facilities.
Public Facilities Policy PF.P-35	Provide for the costs of operating and maintaining storm drainage facilities by establishing the appropriate funding entity and fees to ensure that the costs are borne by those receiving benefit.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Public Facilities Policy PF.P-36	Support Solano County Water Agency efforts to improve flood control and storm drain facilities.
Public Facilities Program PF.I-32	As a condition of project approval, require new development to provide adequate on-site and off-site stormwater and drainage facilities to control both direct and indirect erosion and discharges of pollutants and or sediments so that "no net increase in runoff" occurs as a result of the proposed project. To determine the needs for facilities and best management practices, the county will require, when necessary, that a licensed and county approved civil engineer perform a hydrological/drainage analysis. In cases where a local or regional drainage facility may be the best solution to serve multiple properties or an entire drainage basin, the county will work with property owners and public agencies with jurisdiction in the affected area to devise an appropriate funding mechanism (e.g. impact fees, assessment district) for such facilities.
Public Facilities Program PF.I-33	Require that future development in the limited industrial area northeast of Dixon be consistent with applicable drainage studies and regional drainage plans applicable to the area, in coordination with the City of Dixon, Resource Conservation Districts and other agencies. Prior to development of this area, the applicant shall enter into a development agreement with the County specifying how drainage and traffic impacts would be mitigated. The County shall work in cooperation with the City of Dixon, Resource Conservation Districts and other agencies in determining impacts and mitigation strategies.
Public Facilities Program PF.I-33	Provide incentives (such as water quality credits, larger paved areas, or other site plan consideration) for replacing areas that use extensive impermeable materials with permeable materials for surfaces such as driveways, parking lots, and sidewalks in the unincorporated county.
Flood Control	
Public Facilities Policy PF.P-37	Encourage and pursue the consolidation of flood control management responsibilities within a single country-wide entity.
Health and Safety Policy HS.P-1	Prevent or correct upstream land use practices that contribute to increased rates of surface water runoff.
Health and Safety Policy HS.P-2	Restore and maintain the natural functions of riparian corridors and water channels throughout the county to reduce flooding, convey stormwater flows, and improve water quality.
Health and Safety Policy HS.P-3	Require new developments to incorporate devices capable of detaining the stormwater runoff caused by a 100-year storm event or to contribute to regional solutions to improve flood control, drainage, and water recharge.
Health and Safety Policy HS.P-4	Encourage the use of stormwater detention that may also be used for groundwater recharge.
Health and Safety Policy HS.P-5	Appropriately elevate and flood proof developments for human occupancy within the 100-year floodplain for the profile of a 100-year flood event.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Health and Safety Regulation HS.I-1	Include appropriate Central Valley Flood Protection Plan measures within the county zoning ordinance update to be completed after adoption of the General Plan.
Health and Safety Program HS.I-2	Revise the county zoning ordinance to: (1) limit activities that contribute to increased rates of surface water runoff, such as overgrazing by livestock, clearing, and burning, which can reduce natural vegetative cover; (2) promote recreational, open space, and agricultural uses upstream of watershed areas, where appropriate; (3) limit the construction of extensive and permeable surfaces and promote the use of permeable materials for services such as driveways, streets, parking lots, and sidewalks; (4) require development upstream watershed areas to follow best management practices for stormwater management, including on-site detention and retention basins, appropriate landscaping, and minimal use of impervious surfaces; and (5) Designate resource areas for preservation, including agriculture, wetlands, floodplains, recharge areas, riparian zones, open space, and native habitats.
Health and Safety Program HS.I-4	Require periodic stream maintenance by private property owners and undertake regular stream maintenance by the appropriate public agencies.
Health and Safety Program HS.I-5	Continue to make regular flood control and drainage improvements as recommended by local agency plans, the US Army Corps of Engineers, and the California Reclamation Board. These actions are independent of and in addition to the development review process.
Health and Safety Program HS.I-6	During project review, require the use of stormwater management techniques in developed upstream watershed areas that protect low lying areas from flooding. Incorporate appropriate measures into the development review process to mitigate flooding and prevent erosion in and around county ditches.
Health and Safety Program HS.I-7	In review of new development projects, require disclosure of risk where proposed development would occur in flood risk areas. This disclosure may include notifying new residents in these areas and encouraging purchase of appropriate insurance.
Health and Safety Program HS.I-8	Work with Solano County Water Agency (or successor agency) to review existing developments contributing to increased runoff and to reduce runoff wherever possible.
Health and Safety Program HS.I-12	Work with Solano County Water Agency to create a countywide comprehensive flood management plan.
Health and Safety Program HS.I-14	Work with the Solano County Water Agency (or successor agency) in preparing a hydrological analysis of uplands, identifying the different watersheds that drain into the county, establishing flood-related objectives and priorities on a study area basis, and translating those into coordinated series of flood preventative measures for each watershed.
Health and Safety Program HS.I-15	Conduct an annual review of the 100-year and 200-year flood plain maps.

General Plan Goal, Policy or Program #	Goal, Policy, or Program
Health and Safety Program HS.I-16	Investigate and pursue the creation of 1 regional or county wide agency for flood control purposes. Investigate consolidating flood control responsibilities for the entire county into the Solano County Water Agency.

Appendix D: Communications and Engagement Plan

Communications and Engagement Action Plan

Contents

1) Introduction

Solano County seeks to prepare an integrated water supply and drainage implementation framework ("One Water Framework") for the unincorporated county to integrate planning and implementation of water supply and drainage improvements, flood protection, and ecosystem enhancements that include nature-based solutions. A One Water approach carefully manages water resources to maximize benefits, such as integrating drainage systems to recharge groundwater supplies and/or enhance ecosystem services, and moves away from the more traditional approach of developing projects to address a single water resource issue. The One Water Framework will further provide the foundation for development of a future Solano County Water Utilities Master Plan.

The One Water Framework is to be developed through a stakeholder-driven process to identify water resources-related challenges and opportunities, and priorities for future implementation under a Solano County Water Utilities Master Plan. Development of the Framework relies on stakeholder communication and engagement for success. Stakeholder input will ensure Solano County considers issues, challenges, and suggestions from interested parties who will assist with both development of the One Water Framework and implementation of the Master Plan. The One Water Framework Communications and Engagement Action Plan ("Action Plan") identifies key stakeholders and guides the outreach approach, including project milestones and deadlines to meet key deliverables.

The following subsections provide the background and objectives of the Action Plan; stakeholder identification; key messages and discussion topics; venues for engagement; and implementation timeline.

2) Action Plan Objective

The Action Plan's objective is to engage stakeholders including customers (water users, beneficiaries of wastewater treatment and flood control), providers (water suppliers, recycled water suppliers, irrigation districts, flood control and drainage entities), and other parties with water governance responsibilities

(resource management agencies, land use jurisdictions) in development of the One Water Framework. Local organizations in Solano County have developed multiple planning documents, tools, and suites of potential projects to help evaluate and solve complex problems associated with water supply, wastewater sanitation, flood management, and environmental protection. The Action Plan provides the blueprint for Solano County to work with interested parties to develop integrated water resource conceptual projects for consideration as part of the future One Water Master Plan.

As shown in the following sections the Action Plan includes four outreach strategies: 1) use of a Steering Committee; 2) Steering Committee outreach to their broader network, 3) outreach to interested parties/public meetings; 4) email newsletters/public bulletins.

3) Steering Committee Identification and Role

The One Water Framework Steering Committee ("Steering Committee") will provide continuous input to the process to understand issues and to develop conceptual integrated water resource projects and will guide outreach efforts. The Steering Committee shall provide direction for the One Water Framework development, help develop the outline, provide data, and review draft documents. Solano County will invite agency representatives of water supply, drainage, and wastewater to participate in the Steering Committee during the initial outreach process, including the representatives from the unincorporated County, and local agricultural and drainage programs. Solano County will use time adjacent to existing meetings and forums to the greatest extent possible to hold Steering Committee meetings so as to efficiently obtain guidance and input on the One Water Framework.

Solano County will identify Steering Committee members using the following approach:

1. Develop an initial list of likely Steering Committee participants
2. Identify project issues and groups that represent those issues (e.g., water, wastewater, land use).
3. Review of past projects and the stakeholders in those projects, including the recent groundwater sustainability plans
4. Asking agencies and individuals on the initial list if any additional individuals or groups should be invited to participate and if they should participate as part of the Steering Committee.

Table 1 identifies the "Steering Committee Member List", consisting of agencies, their water-related interests, and individual staff important for supporting the One Water Framework effort. Solano County will invite entities on the list to participate in the Steering Committee, as well as ask these entities to identify other entities/groups to participate in the Steering Committee or as a general "interested party". Further, Steering Committee members will be asked to solicit input and feedback on One Water topics through their broader network.

Table 1: Steering Committee

Name/Contact	Entity Name	Role
Benjamin Voight	Cal Water - Dixon	Municipal water supply
Jordan Santos	City of Dixon	Municipal water supply, wastewater, stormwater
Michael Hether	City of Fairfield	Municipal utilities
Robin Borre	City of Rio Vista	Municipal utilities
Nouae Vue	City of Suisun City	Municipal utilities
Justen Cole	City of Vacaville/Vacaville GSA	Municipal water supply, wastewater provider, groundwater sustainability agency, stormwater
Melissa Cansdale	City of Vallejo	Municipal utilities
Beth Schoenberger	City of Vallejo	Municipal utilities
Kelly Huff	Dixon RCD	Agricultural irrigation, drainage
Jordan Damerel	Fairfield-Suisun Sewer District	Municipal wastewater, recycled water
Emily Corwin	Fairfield-Suisun Sewer District	Municipal wastewater, recycled water
Sachi Itagaki	Kennedy Jenks	Consultant Team
Meredith Clement	Kennedy Jenks	Consultant Team
Jennifer Larsen	Kennedy Jenks	Consultant Team
Masoom Desai	Kennedy Jenks	Consultant Team
Marina Magana	Kennedy Jenks	Consultant Team
Nick Watterson	LSCE	Consultant Team
Don Holdener	Maine Prairie Water District	Irrigation water
Dale Crossley	Reclamation District 2068	Delta water use
Justin Noutary	Reclamation District 2068	Delta water use
Dale Motiska	Rural North Vacaville Water District	Small Water System
Ed King	Solano County Agricultural Commissioner	Agriculture
Lisa Shipley	Solano County Farm Bureau	Agriculture
Misty Kaltreider	Solano County Resources Management Agency	Unincorporated County
Dick Tzou	Solano County Resources Management Agency	Unincorporated County
James Bezek	Solano County Resources Management Agency	Unincorporated County

Name/Contact	Entity Name	Role
Chris Lee	Solano County Water Agency/Solano GSA	Wholesale water supplier, flood control, Groundwater Sustainability Agency
Alex Rabidoux	Solano County Water Agency	Wholesale water supplier, flood control, Groundwater Sustainability Agency
Cary Keaten	Solano Irrigation District/SID GSA	Agricultural water supplier, unincorporated M&I supplier, tail water, small water systems
Chris Rose	Solano Resource Conservation District	Agricultural irrigation, drainage
Steve Chappell	Suisun Resource Conservation District	Marsh and slough management
Tracy Rideout	Vallejo Flood and Wastewater District	Wastewater, stormwater (municipal and unincorporated county)
Mark Tomko	Vallejo Flood and Wastewater District	Wastewater, stormwater (municipal and unincorporated county)
Nick Burton	Solano Transportation Authority	County-wide agency, drainage issues
Erik Ringleberg	Reclamation District 501	The Freshwater Trust
Amy King	Solano Resource Conservation District	Agricultural irrigation, drainage
Brandon Rodriguez	City of Dixon	Municipal water supply, wastewater, stormwater
Chris Fong	City of Dixon	Municipal water supply, wastewater, stormwater
Danielle Bonham	City of Benicia	Municipal water supply
Gustavo Cruz	Solano County Water Agency	Flood control
Jigar Shah	City of Vacaville	Municipal water supply, wastewater provider, groundwater sustainability agency, stormwater
Paul Fuchslin	Solano Irrigation District/SID GSA	Agricultural water supplier, unincorporated M&I supplier, tail water, small water systems
Rainer Garcia	City of Benicia	Water Treatment Superintendent
George Shimboff	City of Fairfield	Municipal utilities

Table 2: Other Interested Parties

Name/Contact	Entity Name	Role
Wanda Williams	Solano Co Supervisor District 3	
Lisa Howard	Tolenas Winery; Solano Valley Vintners and Growers	
Chris Rico	Solano Economic Development Corporation	Public-private nonprofit for economic growth of Solano Co; collaborate with cities, county, etc to deliver resources

3.1) Steering Committee Input

Based on an outline of the One Water Framework, Solano County will seek Steering Committee input at eleven touch points as shown in Table 3:

Table 3: Input Sought from Steering Committee

Topic	Specific Input Sought from Steering Committee
Meeting 1 • Introduction to the Process of Developing the One Water Framework • Needs and Opportunities for Collaboration	○ Identification of other Steering Committee members, identification of interested parties ○ Identification of regional planning documents
Meeting 2 • Regional Issues, Challenges, and Opportunities • Identify Goals of Water Utility Master Plan	○ Identification of issues by geography, including issues related to Small Water Systems, drainage, water supply issues for ag, water supply issues for ag support services, wastewater disposal issues for ag supporting services, other ○ General agreement on regional issues, challenges, and opportunities ○ Agreement on "top 5" regional issues
Meeting 3 • Conclusion of Regional Issues, Challenges, and Opportunities (Steering Committee will discuss input received from other interested parties, including input/feedback received during outreach of Steering Committee members to their networks)	○ General agreement on the issues, challenges, and opportunities that Solano County will present to other interested parties based on feedback from the Steering Committee
Meeting 4 • Regional Issues, Challenges, and Opportunities (if needed)	○ Finalization of regional issues, challenges, and opportunities
Meeting 5 • Review of Administrative Draft One Water Framework Chapters 1-3 • Setting of One Water Goals	○ Input to Administrative Draft One Water Framework Chapters 1 – 3 (after meeting)
Meeting 6 • Review of Administrative Draft One Water Framework Chapters 4-5	○ Finalization of One Water Goals ○ Input to Administrative Draft One Water Framework Chapters 4-5 (after meeting)
Meetings 7 and 8 • Identification of Conceptual Projects • Other miscellaneous business, catchup if needed	○ Participation in workshop identifying past and current projects that address One Water Goals ○ Brainstorming of how agencies could participate in concepts/projects to create multiple benefit outcomes

Topic	Specific Input Sought from Steering Committee
	○ Review of materials for solicitation of project concepts from other interested parties
Meeting 9 • Review of Administrative Draft One Water Framework Chapters 6-9	○ Input to Administrative Draft One Water Framework Chapters 6-9 (after meeting) ○ Input on financing strategies
Meeting 10 • Review of Administrative Draft One Water Framework • Review of outreach materials for Public Draft One Water Framework	○ Commitment to discussing One Water Framework with larger network, providing information on how interested parties can comment on One Water Framework ○ Input to outreach materials for One Water Framework
Meeting 11 • Review of stakeholder and public comments on draft One Water Framework	○ General agreement on needed revisions to the One Water Framework based on public comments ○ Input on preparation of presentation to Boards of Directors/Board of Supervisors

4) Outreach to Interested Parties

Although the Steering Committee will broadly represent local organizations with an interest in the One Water Framework, Solano County also will reach out to the general public for input on the One Water Framework, including representatives of business groups, tribes, non-profit and other nongovernmental organizations, private citizens, agricultural interests, and others who are interested in or could be affected by the development and implementation of the One Water Framework. This additional public engagement will allow Solano County to understand regional issues and challenges (Public Meeting #1) and to vet potential project concepts with interested parties and to secure their feedback on the overall One Water Framework (Public Meeting #2). Table 4 provides the topics Solano County will cover in each public meeting and how the public meetings relate to Steering Committee meetings.

To reach interested parties that may not be associated with the Steering Committee, Solano County is planning two public meetings. To reduce meeting burden, existing forums will be used to promote the public meetings. The proposed forums that meet regularly that could be targeted include:

- Solano County SB 552 Small System Drought Task Force meetings,
- Chamber of Commerce meetings, and
- Other meetings as identified

Solano County assembled an interested parties list, building on existing committees and work groups such as the Solano County Drought Task Force, the Solano Subbasin GSA, Solano Water Advisory Committee,

the Dixon RCD Irrigated Lands participation, and will be update it in coordination with the Steering Committee and throughout the preparation of the One Water Framework. The organizations that are currently a part of the interested party list are found in Appendix A.

To allow interested parties to track the progress of the development of the One Water Framework, Solano County will issue public meeting bulletins. These public bulletins will be in the form of a newsletter based email sent to the Steering Committee for distribution as well as entities in Appendix A and will also be published on the Solano County website. The public bulletin will describe the general progress of drafting the One Water Framework, the upcoming opportunities for input (time and access information to upcoming meetings), and topics of the upcoming meetings.

Interested parties will have a variety of opportunities to discover and establish mutually beneficial partnerships through participation in public meetings or Steering Committee Meetings and will be asked to provide input during the One Water Framework process. All meetings will include an opportunity for interested parties to provide input regarding issues, interests, and challenges and solicitation of projects, in verbal and written form. Further, the intent is to post and allow the interested parties to comment on the One Water Framework for 30 days prior to the presentation of the plan to the Solano County Board of Supervisors (Board). Outreach will culminate in a presentation to the Board. This will give both the public yet another opportunity to comment and provide input as well as the Board the opportunity to comment on the One Water Framework.

Table 4: Solano One Water Meeting and Framework Topics

	Steering Committee	**Interested Parties/ General Public**
Forum/Frequency/Topic	Task 1.2b Approximately every 6-8 weeks, 11 meetings total	Tasks 1.2c and 1.2d 2 Meetings
Introduction to Process of Developing the One Water Framework Assess Challenges and Opportunities (Task 1.4) Input on Regional Issues and Challenges (Chapter 3)	Steering Committee Meeting #1 March 2023	
Topic Specific Meetings for Regional Issues and Challenges 1. Small Water Systems 2. Drainage 3. WW/RW for Ag 4. Water-related services for Ag Support Areas 5. Other Meetings will focus on specific geography (e.g., east side vs west side of County), but cover all topics.	Steering Committee Meetings #2, (Eastern), 3 (Western) and 4 (Summary) if needed (May –July 2023)	Public Meeting #1. August 2023 Public Bulletin #1 August 2023
Submit Administrative Draft One Water Framework Chapters 1-3 (Task 4): Introduction to the Region Benefits of Planning at a Regional Scale Regional Issues and Challenges	Steering Committee Meeting #5 August/September 2023	
Setting of One Water Master Plan Goals (Task 1.5)		
Submit Administrative Draft One Water Framework Chapters 4-5 (Task 4):	Steering Committee Meeting #6 September/October 2023	Public Bulletin #2 November 2023

Forum/Frequency/Topic	Steering Committee Task 1.2b Approximately every 6-8 weeks, 11 meetings total	Interested Parties/ General Public Tasks 1.2c and 1.2d 2 Meetings
Goals that Integrate all Aspects of Water Resources Management Measuring Success toward Goals (Task 1.5)		
Development of One Water Project Concepts/Case Studies (Tasks 2.1 and 2.2, Chapter 7)	Steering Committee Meeting #7 and # 8 - November 2023/January or February 2024	
Submit Administrative Draft One Water Framework Chapters 6-9 (Task 4): One Water Concepts/Case Studies Implementation Plan and Recommendations Adaptive Management and Long-Term Implementation Plan (Task 2.3 and Task 3)	Steering Committee Meeting #9 April 2024	Public Bulletin #3 June 2024
Admin Draft One Water Framework (Task 4)	Steering Committee Meeting #10 August 2024	
Public Draft One Water Framework (Task 4), Public Comment		Public Meeting #2 September 2024 Public Bulletin #4
Public Comments Final One Water Framework (Task 4)	Steering Committee Meeting #11 September 2024	
Total # of Meetings	**11 Steering Committee Meetings**	**2 Stakeholder Meetings**

5) Key Messages and Discussion Topics

Table 4 above identifies the key topics Solano County will present during the course of the One Water Framework development, the timing of email newsletters/public bulletins, deliverables, as well as the relationship between the various meetings.

6) Timeline

Figure 1 is a timeline for the activities, such as Steering Committee meetings, interested parties/general public meetings, and public bulletin distribution related to the One Water Framework development.

Solano One Water Framework Schedule

Updated 4/11/23

Task/Milestone	2023 F	M	A	M	J	J	A	S	O	N	D	2024 J	F	M	A	M	J	J	A	S	O
Develop Action Plan																					
Review Action Plan																					
Final Action Plan																					
Compile List of Management Plans																					
Steering Committee Meetings 1-3		1		2	3	4															
Stakeholder Meeting 1																					
Public Bulletin 1																					
Admin Draft Regional Challenges and Opportunities																					
Admin Draft Benefits of Planning at Regional Scale																					
Review One Water Framework Chapters 1-3																					
Admin Draft Goals that Integrate Water Management																					
Steering Committee Meeting 5								5													
Review One Water Framework Chapters 4-5																					
Public Bulletin 2																					
Steering Committee Meeting 6									6												
Identification of Projects																					
Steering Committee Meeting 7										7											
Admin Draft Project Concepts/Case Studies																					
Steering Committee Meeting 8												8									
Review One Water Framework Chapter 7																					
Steering Committee Meeting 9														9							
Public Bulletin 3																					
Admin Draft Adaptive Management																					
Admin Draft Financing Strategies																					
Review One Water Framework Chapters 6, 8-9																					
Admin Draft One Water Framework																					
Steering Committee Meeting 10																			11		
Public Draft One Water Framework																					
Stakeholder Meeting 2																					
Public Bulletin 4																					
Public Review One Water Framework																					
Presentation to Board of Supervisors																					
Final One Water Framework																					

Legend

- Communications and Engagement Action Plan
- Compile Management Plans
- Steering Committee Mtgs
- Stakeholder Mtgs
- Public Bulletin
- S1W Framework Section
- BOS Presentation

Figure 1: Solano One Water Framework Schedule

Appendix A: Stakeholder Organization Reference List

Organization Name
Central Valley Regional Board
Division of Drinking Water District 4
Dixon Chamber of Commerce
Rio Vista Chamber of Commerce
San Francisco Regional Board
Solano Ag Advisory Committee
Solano Bayshore Resiliency Roundtable
Solano Community Foundation
Solano County Department of Planning
Solano County Environmental Health
Solano Land Trust
Solano Stormwater Alliance
Solano Subbasin GSA Collaborative
Solano Transportation Authority
UC Cooperative Extension
Vacaville Chamber of Commerce
Yocha Dehe Wintun Nation
Dixon Chamber of Commerce

Appendix E: Data Sources to Support Water Projects

Appendix E: Data Sources to Support Water Projects

Name of Data Management System	Responsible Party	Groundwater	Stream/River	Reservoir Operations	Water system	Wastewater	Stormwater	Flood	Climate	Contamination/Hazardous Waste	Sensitive Habitats	Demographics	Land Use	Location of Data
Plan Bay Area 2050 Final Blueprint Growth Pattern	Association of Bay Area Governments											x	x	https://planbayarea.org/digital-library/plan-bay-area-2050-final-blueprint-growth-pattern
E-4 Historical Population Estimates for Cities, Counties, and the State	CA Department of Finance											x		https://dof.ca.gov/forecasting/demographics/estimates/
California Natural Diversity Database	CA Department of Fish and Wildlife										x			http://www.dfg.ca.gov/biogeodat a/cnddb/
The Vegetation Classification and Mapping Program	CA Department of Fish and Wildlife										x			http://www.dfg.ca.gov/biogeodat a/vegcamp/
EnviroStor	CA Department of Toxic Substances Control									x				https://www.envirostor.dtsc.ca.gov/public/
2020 Urban Water Management Plans	CA Department of Water Resources	x	x		x				x			x	x	https://wuedata.water.ca.gov/
Agricultural Water Managmeent Plans	CA Department of Water Resources	x	x	x									x	https://wuedata.water.ca.gov/
California Data Exchange Center	CA Department of Water Resources		x	x				x	x					http://cdec.water.ca.gov/
California Irrigation Management Information System	CA Department of Water Resources								x					http://www.cimis.water.ca.gov/
California Statewide Groundwater Elevation Monitoring	CA Department of Water Resources	x												https://www.water.ca.gov/Programs/GroundwaterManagement/GroundwaterElevation-Monitoring--CASGEM
Land Use Viewer	CA Department of Water Resources												x	https://gis.water.ca.gov/app/CADWRLandUseViewer/?dlg=dialog_2&page=home
Levee Evaluation Program	CA Department of Water Resources							x						https://ferix.water.ca.gov/lep/
Levee Flood Protection Zone	CA Department of Water Resources							x						https://gis.lfpz.water.ca.gov/lfpz/
SGMA Portal	CA Department of Water Resources	x												https://sgma.water.ca.gov/portal/
SWP Table A Allocations	CA Department of Water Resources			x										https://water.ca.gov/programs/state-water-project/management/swp-water-contractors
Water Data Library	CA Department of Water Resources	x	x											https://wdl.water.ca.gov/waterdatalibrary/Map.aspx
Well Completion Reports	CA Department of Water Resources	x												https://water.ca.gov/Programs/Groundwater-Management/Wells/Well-Completion-Reports
Cal-Adapt Data Server	Cal-Adapt							x	x					https://cal-adapt.org/data/
Western Regional Climate Center	Desert Research Institute								x					https://wrcc.dri.edu/
Digital Flood Insurance Rate Map	Federal Emergency Management Agency							x				x		https://msc.fema.gov/portal/home
The National Risk Index	Federal Emergency Management Agency							x	x			x		https://hazards.fema.gov/nri/
2025 Blueprint Land Use	Sacramento Area Council of Governments											x	x	https://www.sacog.org/planning/2025-blueprint/blueprint-land-use
General Plans	Solano County, Cities	x			x	x	x					x	x	various
California Public Water Supply Systems Search	State Water Resources Control Board				x									https://sdwis.waterboards.ca.gov/PDWW/

Appendix E: Data Sources to Support Water Projects

Name of Data Management System	Responsible Party	Groundwater	Stream/River	Reservoir Operations	Water system	Wastewater	Stormwater	Flood	Climate	Contamination/Hazardous Waste	Sensitive Habitats	Demographics	Land Use	Location of Data
Electronic Self-Monitoring Report	State Water Resources Control Board					x								https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportEsmrAtGlanceServlet?inCommand=reset
Facility-At-A-Glance	State Water Resources Control Board					x								https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?reportName=facilityAtAGlance&inCommand=reset
GeoTracker	State Water Resources Control Board									x			x	https://geotracker.waterboards.ca.gov/
Interactive Regulated Facilities Report	State Water Resources Control Board					x								https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility
Interactive Sanitary Sewer System Spill Report	State Water Resources Control Board					x								https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportSSOServlet?reportAction=criteria&reportId=sso_main
NPDES Permits	State Water Resources Control Board					x	x							https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/NpdesReportServlet
Party At-A-Glance Report	State Water Resources Control Board					x	x							https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportPartyAtGlanceServlet?inCommand=reset
SAFER	State Water Resources Control Board	x			x							x		https://www.waterboards.ca.gov/safer/safer_data.html
SMARTS Database	State Water Resources Control Board						x							https://smarts.waterboards.ca.gov/
Groundwater Ambient Monitoring and Assessment Groundwater Information System (GAMA GIS)	State Water Resources Control Board	x			x					x				https://www.waterboards.ca.gov/gama/gama-gis.html
Soil Agricultural Groundwater Banking Index	UC Davis CA Soil Resource Lab	x												https://casoilresource.lawr.ucdavis.edu/sagbi/
US Census	US Census Bureau											x		http://www.census.gov/main/www/access.html
Watershed Boundary Dataset	US Department of Agriculture, National Resources Conservation Service		x											http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/water/watersheds/dataset/
Climate and Economic Justice Screening Tool	US Environmental Protection Agency				x	x		x	x	x		x		https://screeningtool.geoplatform.gov/en/#7.37/17.859/-100.737
303(d) Impaired Waters List	US Environmental Protection Agency and San Francisco Bay and Central Valley Regional Water Quality Control Boards		x								x			http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/index.shtml
Water Data for the Nation	US Geological Survey		x											http://waterdata.usgs.gov/nwis
National Hydrography Dataset	US Geological Survey		x											https://www.usgs.gov/national-hydrography/nhdplus-high-resolution
Public Land Survey System	US Geological Survey												x	https://www.usgs.gov/faqs/do-us-topos-and-national-map-have-a-layer-shows-public-land-survey-system-plss

Appendix F: Matrix of Framework Actions vs Goals

#	Implementation Actions	Challenges Addressed			GOAL 1			GOAL 2		GOAL 3					GOAL 4			GOAL 5			REGION	
		Water Supply and Conveyance	Management of Wastewater	Drainage and Flood Management	S 1A	S 1B	S 1C	S 2A	S 2B	S 3A	S 3B	S 3C	S 3D	S 3E	S 4A	S 4B	S 4C	S 5A	S 5B	S 5C	Eastside	Westside
	Partnership Development & Institutional Collaboration																					
1	Expanding the Solano Water Advisory Commission to include flood management and wastewater agencies to collaborate on multi-benefit water resource projects and programs.	X	x	x				x	x							x	x		x		x	x
2	Strengthening cooperation with Solano County Water Agency (SCWA), local irrigation districts, wastewater districts, and city water departments.	x	x	x				x	x					x			x	x	x		x	x
3	Engaging the Dixon Regional Watershed JPA, Reclamation Districts, and Resource Conservation Districts (RCDs) to facilitate flood management efforts.	x		x				x	x							x	x	x	x		x	
4	Developing new agreements for shared water resource management between Solano County, SCWA, SIDwater related special districts , and municipalities.	x	x	x				x	x					x					x		x	x
5	Creating interagency agreements for streamlined flood response and stormwater drainage maintenance.	x	x	x				x	x								x	x	x			x
6	Supporting funding partnerships between public agencies and private stakeholders to expand infrastructure investments.	x	x	x				x	x								x	x	x		x	x
	Data Collection, Analysis, & Infrastructure Assessments																					
7	Mapping all existing water supply, wastewater treatment, and stormwater systems.	x	x	x	x	x				x		x		x		x					x	x
8	Collecting and standardizing groundwater and surface water monitoring data.	x		x	x	x				x		x		x							x	x
9	Establishing data-sharing and funding agreement(s) among agencies for water resource tracking.	x	x	x	x	x				x		x				x					x	x
10	Inventorying public and private wells, evaluating water quality, reliability, and production capacity.	x			x	x				x		x					x				x	x
11	Assessing septic and wastewater treatment facilities, identifying system vulnerabilities and upgrade needs.		x		x	x									x			x	x		x	x

#	Implementation Actions	Challenges Addressed			GOAL 1			GOAL 2		GOAL 3					GOAL 4			GOAL 5			REGION	
		Water Supply and Conveyance	Management of Wastewater	Drainage and Flood Management	S 1A	S 1B	S 1C	S 2A	S 2B	S 3A	S 3B	S 3C	S 3D	S 3E	S 4A	S 4B	S 4C	S 5A	S 5B	S 5C	Eastside	Westside
12	Exploring consolidation opportunities for small water systems.	x			x	x				x		x	x	x				x	x	x	x	x
13	Evaluating flood control structures, ensuring they meet current and future flood and climate change needs.	x		x	x	x									x	x	x	x	x	x	x	x
14	Developing a countywide drainage and flood control management plan.	x		x	x	x					x		x		x	x	x	x	x	x	x	x
15	Developing a hydrological model of the Fairfield-Suisun Valley Groundwater Basin.	x		x	x	x				x	x	x	x		x	x	x			x		x
16	Evaluating Managed Aquifer Recharge (MAR) opportunities across Solano County.	x		x	x	x				x	x		x		x	x	x			x	x	
17	Investigating septic system impacts on groundwater quality.	x	x		x	x				x								x		x		x
	Policy Implementation and Update																					
18	Ensuring new developments comply with sustainable water use and conservation measures.	x	x	x			x			x		x	x		x			x	x	x	x	x
19	Updating General Plan, zoning, and permitting processes and creating development plans to encourage multi-benefit water projects.	x	x	x			x			x					x					x	x	x
20	Developing incentives for water reuse, stormwater capture, and conservation.	x	x	x						x	x		x		x	x	x	x	x	x	x	x
21	Assessing options for extending municipal water and wastewater services to accommodate future growth.	x	x		x	x						x	x	x				x	x		x	x
	Public Engagement and Education																					
22	Developing Stakeholder Engagement Plan	x	x	x	x			x	x	x	x	x	x				x		x	x	x	x
23	Advancing public education on water conservation & resilience	x	x	x	x		x	x	x	x	x	x	x				x		x	x	x	x
24	Strategizing funding approaches for implementation	x	x	x						x	x	x	x						x	x	x	x
25	Implementing adaptive management & ongoing evaluation	x	x	x	x					x	x	x							x		x	x

#	Implementation Actions	Challenges Addressed			GOAL 1			GOAL 2		GOAL 3					GOAL 4			GOAL 5			REGION	
		Water Supply and Conveyance	Management of Wastewater	Drainage and Flood Management	S 1A	S 1B	S 1C	S 2A	S 2B	S 3A	S 3B	S 3C	S 3D	S 3E	S 4A	S 4B	S 4C	S 5A	S 5B	S 5C	Eastside	Westside

Goals:

1: Support Implementation of the Solano County General Plan in Relation to Integrated Water Resources Planning

2: Develop Governance Structures to Support Regional Water Resources Management through Interagency Collaboration and Partnership

3: Enhance Local Sustainable Water Supply and its Reliability and Climate Change Resiliency

4: Improve Localized Drainage and Flood Protection

5: Implement Multi-Benefit Strategies, Projects, and Programs through the Management and Integration of all Water Resources

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