APPENDICES (Volume 2)

For the

Municipal Service Review and

Sphere of Influence Update

WASTEWATER SERVICES

Prepared by:

SWALE inc

Prepared for:

Contra Costa LAFCO

https://www.contracostalafco.org/

May 22, 2024

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Appendix A

Demographic Data, Contra Costa County

United States Census Bureau

QuickFacts

Contra Costa County, California; United States

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

All Topics	Contra Costa County, California	United States
Population estimates, July 1, 2023, (V2023)	**1,155,025**	**334,914,895**
PEOPLE		
Population		
Population estimates, July 1, 2023, (V2023)	**1,155,025**	**334,914,895**
Population estimates base, April 1, 2020, (V2023)	1,165,930	331,464,948
Population, percent change - April 1, 2020 (estimates base) to July 1, 2023, (V2023)	-0.9%	1.0%
Population, Census, April 1, 2020	1,165,927	331,449,281
Population, Census, April 1, 2010	1,049,025	308,745,538
Age and Sex		
Persons under 5 years, percent	5.3%	5.6%
Persons under 18 years, percent	21.7%	21.7%
Persons 65 years and over, percent	17.4%	17.3%
Female persons, percent	50.7%	50.4%
Race and Hispanic Origin		
White alone, percent	62.8%	75.5%
Black or African American alone, percent (a)	9.5%	13.6%
American Indian and Alaska Native alone, percent (a)	1.1%	1.3%
Asian alone, percent (a)	20.2%	6.3%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.6%	0.3%
Two or More Races, percent	5.8%	3.0%
Hispanic or Latino, percent (b)	27.0%	19.1%
White alone, not Hispanic or Latino, percent	39.8%	58.9%
Population Characteristics		
Veterans, 2018-2022	41,949	17,038,807
Foreign born persons, percent, 2018-2022	25.4%	13.7%
Housing		
Housing Units, July 1, 2023, (V2023)	432,059	145,344,636
Owner-occupied housing unit rate, 2018-2022	67.2%	64.8%
Median value of owner-occupied housing units, 2018-2022	$787,300	$281,900
Median selected monthly owner costs -with a mortgage, 2018-2022	$3,216	$1,828
Median selected monthly owner costs -without a mortgage, 2018-2022	$886	$584
Median gross rent, 2018-2022	$2,234	$1,268
Building Permits, 2023	2,033	1,511,102
Families & Living Arrangements		
Households, 2018-2022	408,537	125,736,353
Persons per household, 2018-2022	2.82	2.57
Living in same house 1 year ago, percent of persons age 1 year+, 2018-2022	88.8%	86.9%
Language other than English spoken at home, percent of persons age 5 years+, 2018-2022	36.3%	21.7%
Computer and Internet Use		
Households with a computer, percent, 2018-2022	97.1%	94.0%
Households with a broadband Internet subscription, percent, 2018-2022	94.7%	88.3%
Education		
High school graduate or higher, percent of persons age 25 years+, 2018-2022	89.7%	89.1%
Bachelor's degree or higher, percent of persons age 25 years+, 2018-2022	44.5%	34.3%
Health		
With a disability, under age 65 years, percent, 2018-2022	7.4%	8.9%
Persons without health insurance, under age 65 years, percent	5.2%	9.3%

Economy		
In civilian labor force, total, percent of population age 16 years+, 2018-2022	65.0%	63.0%
In civilian labor force, female, percent of population age 16 years+, 2018-2022	59.7%	58.5%
Total accommodation and food services sales, 2017 ($1,000) (c)	2,448,612	938,237,077
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	10,075,376	2,527,903,275
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	1,288,141	895,225,411
Total retail sales, 2017 ($1,000) (c)	14,986,369	4,949,601,481
Total retail sales per capita, 2017 (c)	$13,081	$15,224
Transportation		
Mean travel time to work (minutes), workers age 16 years+, 2018-2022	36.8	26.7
Income & Poverty		
Median household income (in 2022 dollars), 2018-2022	$120,020	$75,149
Per capita income in past 12 months (in 2022 dollars), 2018-2022	$59,083	$41,261
Persons in poverty, percent	⚠ 8.7%	⚠ 11.5%

BUSINESSES

Businesses		
Total employer establishments, 2021	25,202	8,148,606
Total employment, 2021	324,805	128,346,299
Total annual payroll, 2021 ($1,000)	25,756,896	8,278,573,947
Total employment, percent change, 2020-2021	-6.2%	-4.3%
Total nonemployer establishments, 2021	99,203	28,477,518
All employer firms, Reference year 2017	20,054	5,744,643
Men-owned employer firms, Reference year 2017	11,026	3,480,438
Women-owned employer firms, Reference year 2017	3,796	1,134,549
Minority-owned employer firms, Reference year 2017	5,345	1,014,958
Nonminority-owned employer firms, Reference year 2017	12,331	4,371,152
Veteran-owned employer firms, Reference year 2017	976	351,237
Nonveteran-owned employer firms, Reference year 2017	16,746	4,968,606

GEOGRAPHY

Geography		
Population per square mile, 2020	1,626.3	93.8
Population per square mile, 2010	1,465.2	87.4
Land area in square miles, 2020	716.93	3,533,038.28
Land area in square miles, 2010	715.94	3,531,905.43
FIPS Code	06013	1

About datasets used in this table

Value Notes

⚠ Methodology differences may exist between data sources, and so estimates from different sources are not comparable.

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

The vintage year (e.g., V2023) refers to the final year of the series (2020 thru 2023). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2018-2022 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2022 5-year ACS Comparison Guidance page.

Fact Notes

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

Value Flags

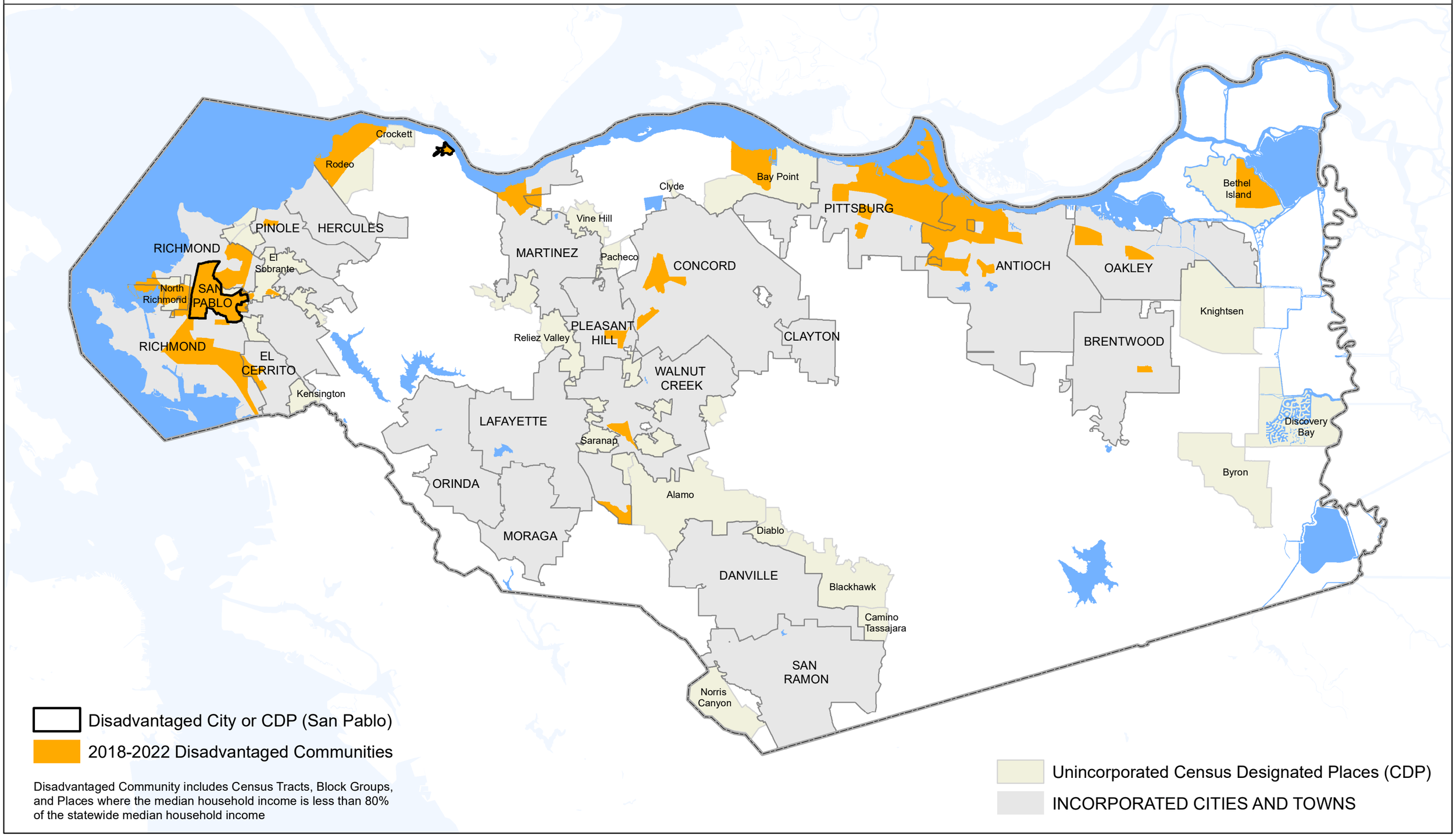
D	Suppressed to avoid disclosure of confidential information
F	Fewer than 25 firms
FN	Footnote on this item in place of data
NA	Not available
S	Suppressed; does not meet publication standards
X	Not applicable
Z	Value greater than zero but less than half unit of measure shown
-	Either no or too few sample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

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

Appendix B

Map Disadvantaged Communities (DAC) Determination, American Community Survey 5-year Estimates

Disadvantaged Communities (DAC) Determination
American Community Survey 5-year Estimates (2018 - 2022)

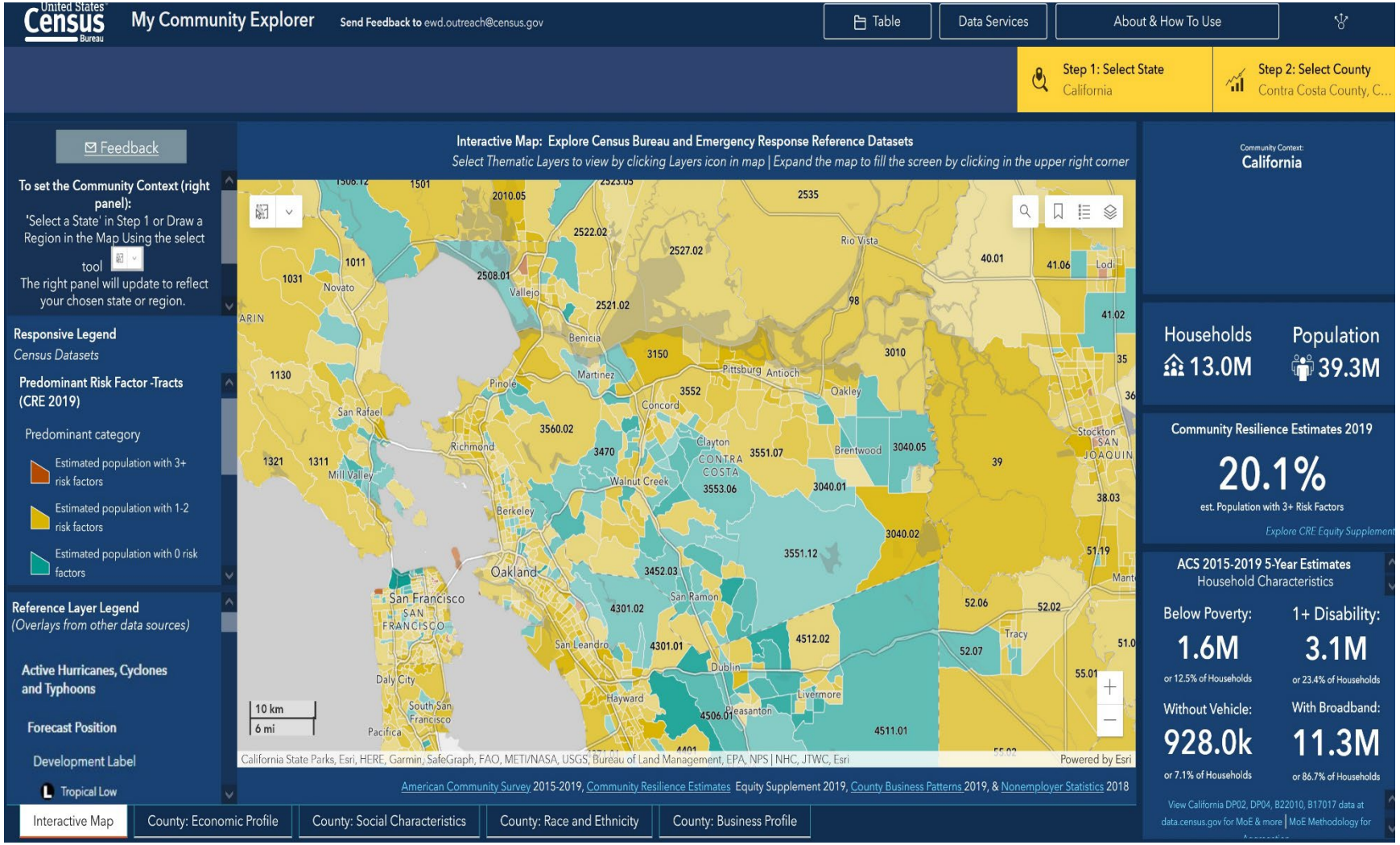


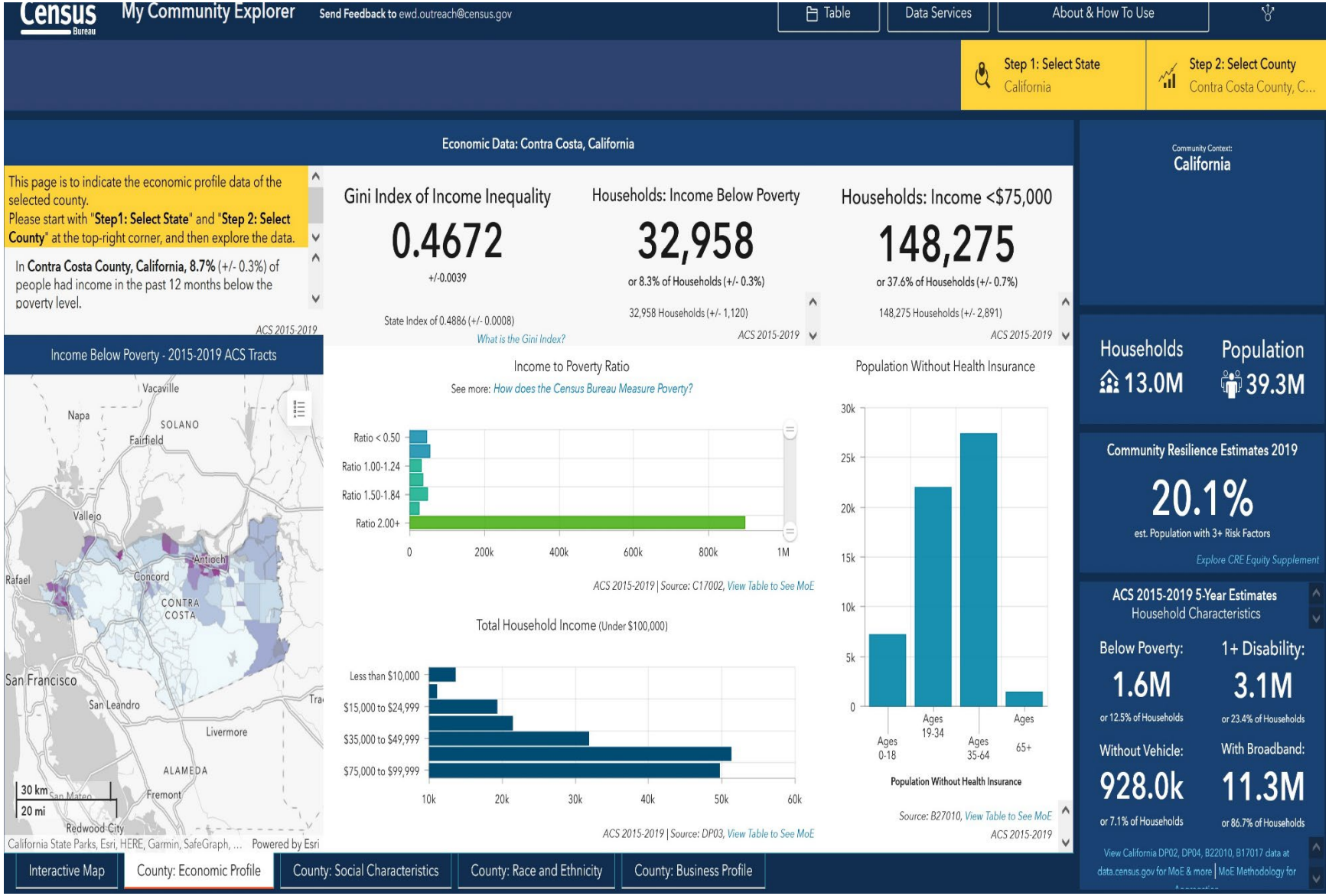
Appendix C

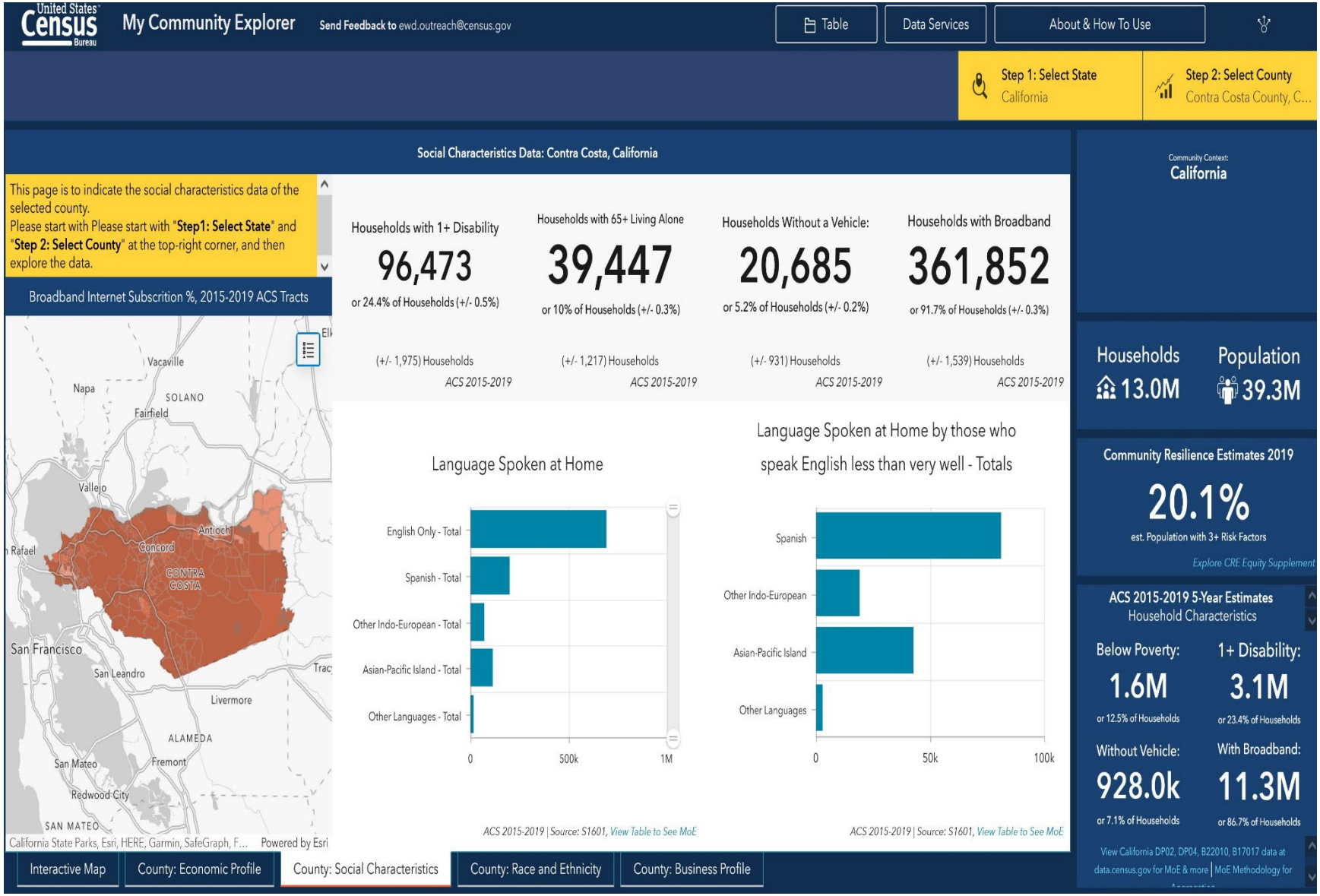
Economic Data - County Costa County U.S. Census

Appendix C: Economic Data - County Costa County U.S. Census

Data Dashboard Retrieved on August 8, 2022 from https://experience.arcgis.com/experience/13a111e06ad242fba0fb62f25199c7dd/page/Page-1/




Census Bureau
My Community Explorer
Send Feedback to ewd.outreach@census.gov
Table
Data Services
About & How To Use
Step 1: Select State
California
Step 2: Select County
Contra Costa County, C...
Economic Data: Contra Costa, California
This page is to indicate the economic profile data of the selected county.
Please start with "Step1: Select State" and "Step 2: Select County" at the top-right corner, and then explore the data.
In Contra Costa County, California, 8.7% (+/- 0.3%) of people had income in the past 12 months below the poverty level.
ACS 2015-2019
Gini Index of Income Inequality
0.4672
+/-0.0039
State Index of 0.4886 (+/- 0.0008)
What is the Gini Index?
Households: Income Below Poverty
32,958
or 8.3% of Households (+/- 0.3%)
32,958 Households (+/- 1,120)
ACS 2015-2019
Households: Income <$75,000
148,275
or 37.6% of Households (+/- 0.7%)
148,275 Households (+/- 2,891)
ACS 2015-2019
Community Context:
California
Households
13.0M
Population
39.3M
Income Below Poverty - 2015-2019 ACS Tracts
Vacaville
Napa
SOLANO
Fairfield
Vallejo
Antioch
Concord
Rafael
CONTRA COSTA
San Francisco
San Leandro
Livermore
ALAMEDA
Fremont
Redwood City
30 km
20 mi
California State Parks, Esri, HERE, Garmin, SafeGraph, ...
Powered by Esri
Income to Poverty Ratio
See more: How does the Census Bureau Measure Poverty?
Ratio < 0.50
Ratio 1.00-1.24
Ratio 1.50-1.84
Ratio 2.00+
0
200k
400k
600k
800k
1M
ACS 2015-2019 | Source: C17002, View Table to See MoE
Total Household Income (Under $100,000)
Less than $10,000
$15,000 to $24,999
$35,000 to $49,999
$75,000 to $99,999
10k
20k
30k
40k
50k
60k
ACS 2015-2019 | Source: DP03, View Table to See MoE
Population Without Health Insurance
30k
25k
20k
15k
10k
5k
0
Ages 0-18
Ages 19-34
Ages 35-64
Ages 65+
Population Without Health Insurance
Source: B27010, View Table to See MoE
ACS 2015-2019
Community Resilience Estimates 2019
20.1%
est. Population with 3+ Risk Factors
Explore CRE Equity Supplement
ACS 2015-2019 5-Year Estimates
Household Characteristics
Below Poverty:
1.6M
or 12.5% of Households
1+ Disability:
3.1M
or 23.4% of Households
Without Vehicle:
928.0k
or 7.1% of Households
With Broadband:
11.3M
or 86.7% of Households
View California DP02, DP04, B22010, B17017 data at data.census.gov for MoE & more | MoE Methodology for
Interactive Map
County: Economic Profile
County: Social Characteristics
County: Race and Ethnicity
County: Business Profile


United States Census Bureau
My Community Explorer
Send Feedback to ewd.outreach@census.gov
Table
Data Services
About & How To Use
Step 1: Select State
California
Step 2: Select County
Contra Costa County, C...
Social Characteristics Data: Contra Costa, California
This page is to indicate the social characteristics data of the selected county.
Please start with Please start with "Step1: Select State" and "Step 2: Select County" at the top-right corner, and then explore the data.
Broadband Internet Subscrition %, 2015-2019 ACS Tracts
Vacaville
Napa
SOLANO
Fairfield
Vallejo
Antioch
Concord
Rafael
CONTRA COSTA
San Francisco
San Leandro
Livermore
ALAMEDA
San Mateo
Fremont
Redwood City
SAN MATEO
California State Parks, Esri, HERE, Garmin, SafeGraph, F...
Powered by Esri
Households with 1+ Disability
96,473
or 24.4% of Households (+/- 0.5%)
(+/- 1,975) Households
ACS 2015-2019
Households with 65+ Living Alone
39,447
or 10% of Households (+/- 0.3%)
(+/- 1,217) Households
ACS 2015-2019
Households Without a Vehicle:
20,685
or 5.2% of Households (+/- 0.2%)
(+/- 931) Households
ACS 2015-2019
Households with Broadband
361,852
or 91.7% of Households (+/- 0.3%)
(+/- 1,539) Households
ACS 2015-2019
Language Spoken at Home
English Only - Total
Spanish - Total
Other Indo-European - Total
Asian-Pacific Island - Total
Other Languages - Total
0
500k
1M
ACS 2015-2019 | Source: S1601, View Table to See MoE
Language Spoken at Home by those who speak English less than very well - Totals
Spanish
Other Indo-European
Asian-Pacific Island
Other Languages
0
50k
100k
ACS 2015-2019 | Source: S1601, View Table to See MoE
Community Context:
California
Households
13.0M
Population
39.3M
Community Resilience Estimates 2019
20.1%
est. Population with 3+ Risk Factors
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County: Race and Ethnicity
County: Business Profile

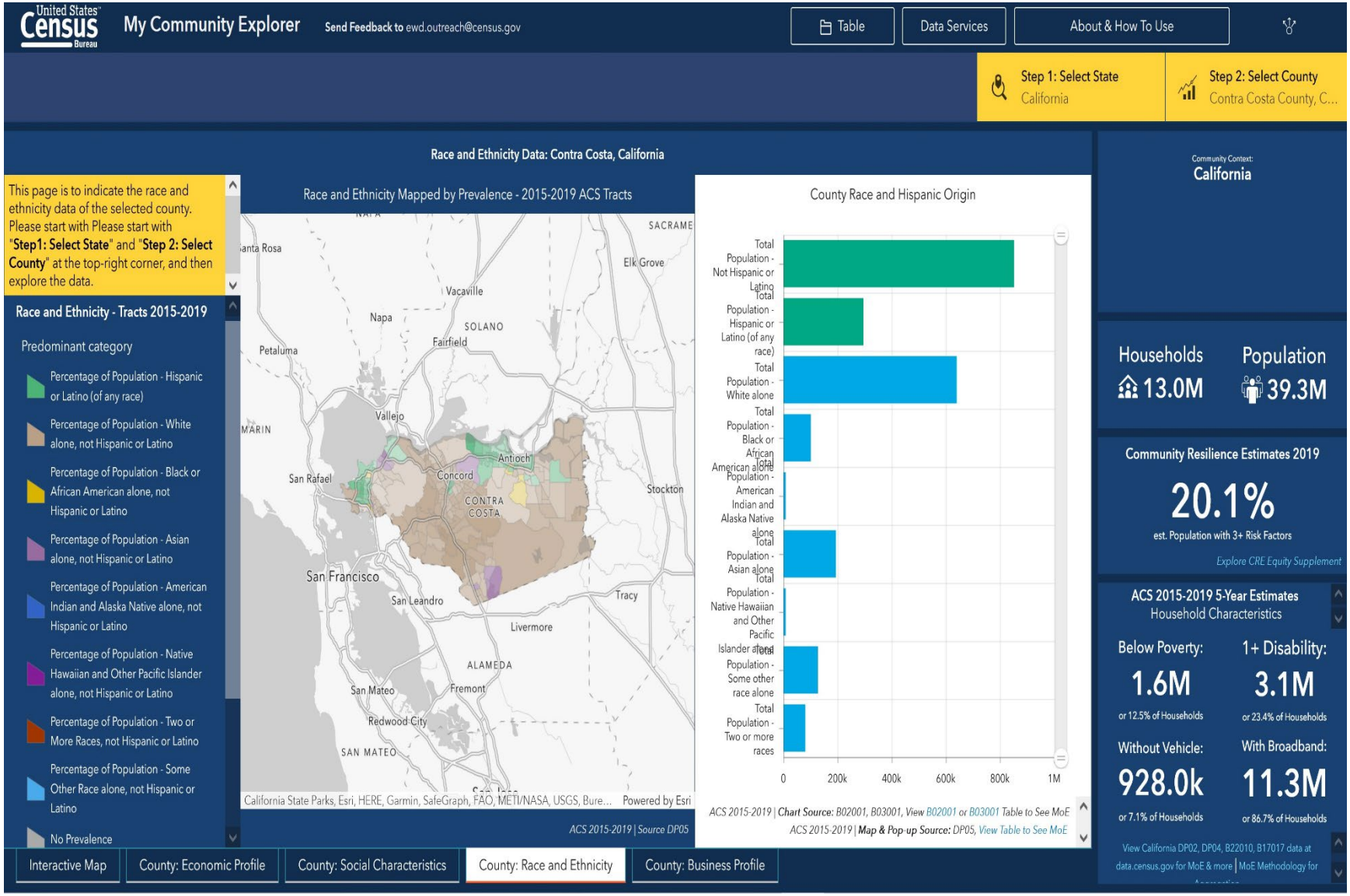
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Table
Data Services
About & How To Use
Step 1: Select State
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Contra Costa County, C...
Race and Ethnicity Data: Contra Costa, California
This page is to indicate the race and ethnicity data of the selected county. Please start with Please start with "Step1: Select State" and "Step 2: Select County" at the top-right corner, and then explore the data.
Race and Ethnicity - Tracts 2015-2019
Predominant category
Percentage of Population - Hispanic or Latino (of any race)
Percentage of Population - White alone, not Hispanic or Latino
Percentage of Population - Black or African American alone, not Hispanic or Latino
Percentage of Population - Asian alone, not Hispanic or Latino
Percentage of Population - American Indian and Alaska Native alone, not Hispanic or Latino
Percentage of Population - Native Hawaiian and Other Pacific Islander alone, not Hispanic or Latino
Percentage of Population - Two or More Races, not Hispanic or Latino
Percentage of Population - Some Other Race alone, not Hispanic or Latino
No Prevalence
Race and Ethnicity Mapped by Prevalence - 2015-2019 ACS Tracts
Santa Rosa
Vacaville
Napa
SOLANO
Fairfield
Petaluma
Elk Grove
Vallejo
MARIN
Antioch
Concord
San Rafael
CONTRA COSTA
Stockton
San Francisco
San Leandro
Tracy
Livermore
ALAMEDA
San Mateo
Fremont
Redwood City
SAN MATEO
California State Parks, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bure...
Powered by Esri
ACS 2015-2019 | Source DP05
County Race and Hispanic Origin
Total Population - Not Hispanic or Latino
Total Population - Hispanic or Latino (of any race)
Total Population - White alone
Total Population - Black or African American alone
Total Population - American Indian and Alaska Native alone
Total Population - Asian alone
Total Population - Native Hawaiian and Other Pacific Islander alone
Total Population - Some other race alone
Total Population - Two or more races
0
200k
400k
600k
800k
1M
ACS 2015-2019 | Chart Source: B02001, B03001, View B02001 or B03001 Table to See MoE
ACS 2015-2019 | Map & Pop-up Source: DP05, View Table to See MoE
Community Context:
California
Households
13.0M
Population
39.3M
Community Resilience Estimates 2019
20.1%
est. Population with 3+ Risk Factors
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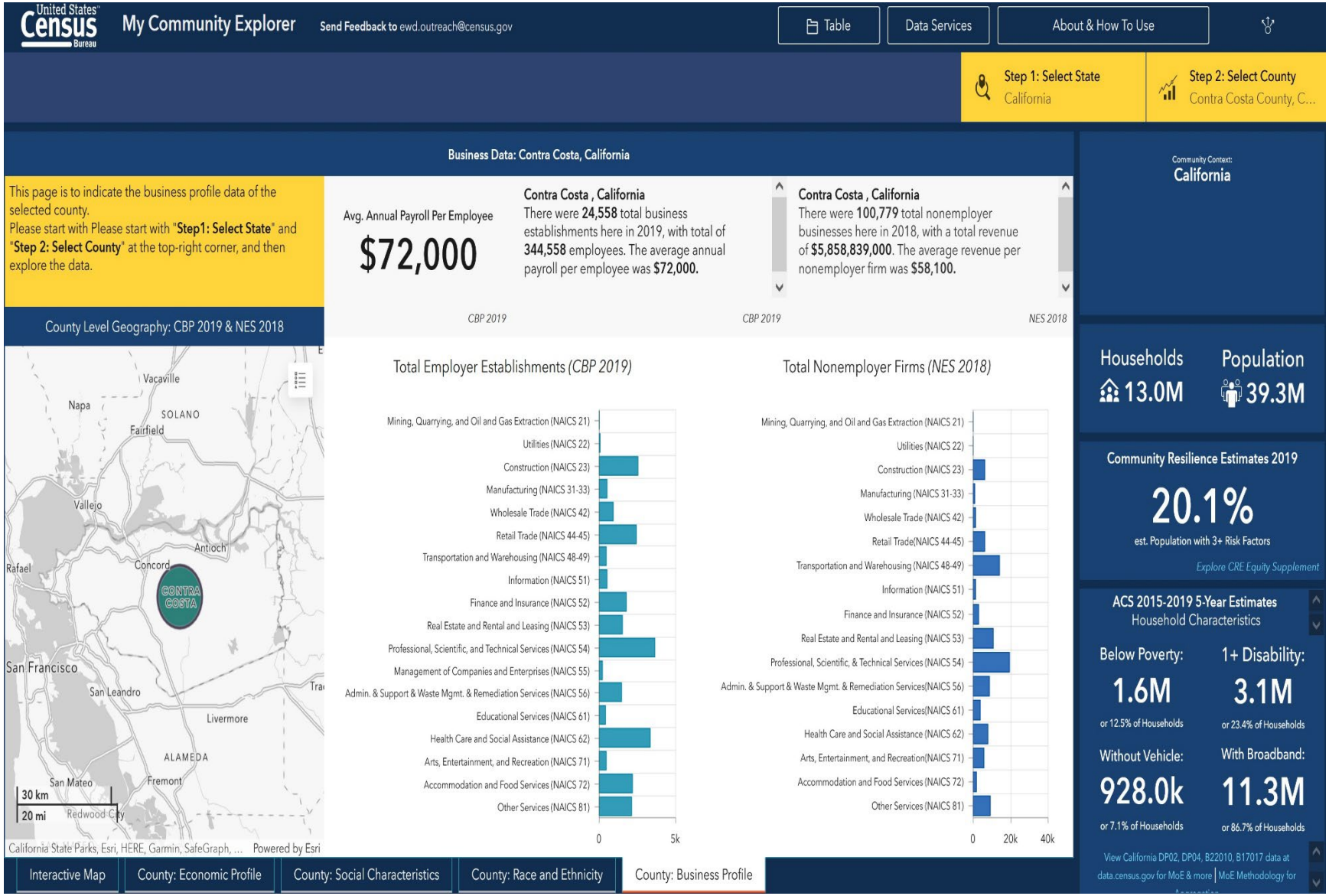
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Data Services
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Step 1: Select State
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Business Data: Contra Costa, California
This page is to indicate the business profile data of the selected county.
Please start with Please start with "Step1: Select State" and "Step 2: Select County" at the top-right corner, and then explore the data.
Avg. Annual Payroll Per Employee
$72,000
CBP 2019
Contra Costa , California
There were 24,558 total business establishments here in 2019, with total of 344,558 employees. The average annual payroll per employee was $72,000.
CBP 2019
Contra Costa , California
There were 100,779 total nonemployer businesses here in 2018, with a total revenue of $5,858,839,000. The average revenue per nonemployer firm was $58,100.
NES 2018
Community Context:
California
County Level Geography: CBP 2019 & NES 2018
Vacaville
Napa
SOLANO
Fairfield
Vallejo
Antioch
Rafael
Concord
CONTRA COSTA
San Francisco
San Leandro
Livermore
ALAMEDA
San Mateo
Fremont
Redwood City
30 km
20 mi
California State Parks, Esri, HERE, Garmin, SafeGraph, ...
Powered by Esri
Total Employer Establishments (CBP 2019)
Mining, Quarrying, and Oil and Gas Extraction (NAICS 21)
Utilities (NAICS 22)
Construction (NAICS 23)
Manufacturing (NAICS 31-33)
Wholesale Trade (NAICS 42)
Retail Trade (NAICS 44-45)
Transportation and Warehousing (NAICS 48-49)
Information (NAICS 51)
Finance and Insurance (NAICS 52)
Real Estate and Rental and Leasing (NAICS 53)
Professional, Scientific, and Technical Services (NAICS 54)
Management of Companies and Enterprises (NAICS 55)
Admin. & Support & Waste Mgmt. & Remediation Services (NAICS 56)
Educational Services (NAICS 61)
Health Care and Social Assistance (NAICS 62)
Arts, Entertainment, and Recreation (NAICS 71)
Accommodation and Food Services (NAICS 72)
Other Services (NAICS 81)
0
5k
Total Nonemployer Firms (NES 2018)
Mining, Quarrying, and Oil and Gas Extraction (NAICS 21)
Utilities (NAICS 22)
Construction (NAICS 23)
Manufacturing (NAICS 31-33)
Wholesale Trade (NAICS 42)
Retail Trade(NAICS 44-45)
Transportation and Warehousing (NAICS 48-49)
Information (NAICS 51)
Finance and Insurance (NAICS 52)
Real Estate and Rental and Leasing (NAICS 53)
Professional, Scientific, & Technical Services (NAICS 54)
Admin. & Support & Waste Mgmt. & Remediation Services(NAICS 56)
Educational Services(NAICS 61)
Health Care and Social Assistance (NAICS 62)
Arts, Entertainment, and Recreation(NAICS 71)
Accommodation and Food Services (NAICS 72)
Other Services (NAICS 81)
0
20k
40k
Households
13.0M
Population
39.3M
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Interactive Map
County: Economic Profile
County: Social Characteristics
County: Race and Ethnicity
County: Business Profile

Appendix D

California's New Housing Laws

APPENDIX D: CALIFORNIA'S NEW HOUSING LAWS

Housing Affordability And Revitalization

The State Legislature has indicated that California needs to build more housing to address current housing problems like the housing shortage and skyrocketing prices. California's legislators have been actively passing bills intended to spur new housing development, specifically affordable housing and housing located near transit. California's legislators have been actively passing bills and during the years 2017 to 2023, they passed approximately 150 new housing laws. These laws are aimed at encouraging local municipalities and the private construction sector to meet housing goals and are generally summarized by the following four bullet points:

- allows institutions like colleges and religious organizations to use portions of their property to build housing,
- continues a state statute used to hold local communities accountable for their fair share of housing.
- CEQA reform
- the Housing Accountability Unit at the California Department of Housing and Community Development was created to make sure cities and counties fulfill their legal responsibilities to plan and permit their fair share of housing.

Regardless of the new housing laws, the practicalities of getting housing built require that local utilizes and municipalities have sufficient existing capacity in their water, electrical, and wastewater systems. This MSR/SOI Update addresses wastewater systems by asking: "*Does the local wastewater service provider have sufficient capacity to accommodate future growth?*" To some extent, this MSR/SOI Update addresses this question based on past levels of growth and based on feedback from the service provider. However, the new housing laws passed by the State Legislature introduce some uncertainty about future growth projections because we do not yet know how local communities will implement these new laws. Will future growth in California continue to be relatively slow (as in the past), or will growth significantly increase?

To answer these questions, Contra Costa County and the incorporated cities therein have recently adopted or are currently working on their 6th Cycle Housing Element Updates and sharing them with the California Dept of Housing and Community Development (https://www.hcd.ca.gov/). The data in this MSR/SOI Update has been designed to provide baseline information to the municipalities that are developing their Housing Element Updates. Therefore, it is recommended that LAFCO continue to review and provide comments on Housing Element Updates to ensure that this new MSR/SOI Update is considered.

Given the uncertainty introduced by these new housing laws, it is premature for this MSR/SOI Update to attempt to answer these big-picture issues that affect the entire state. Additional study is needed

to adequately answer the questions about future growth rates and wastewater infrastructure capacity.

LAFCO has produced this MSR/SOI Update as a resource that can guide future conversations about these important issues. As future housing is planned and built, it is critical that local cities and Contra Costa County closely coordinate with LAFCO and wastewater service providers to assess capacity of the collection systems, wastewater treatment plants, and permitting. Wastewater service providers face significant financial, water quality, and regulatory constraints, which may create a barrier that precludes infrastructure expansion unless significant financial resources are dedicated.

Table A-C-1 below provides a partial list of the new housing laws passed by the CA Legislature in recent years. A more complete list of the new housing laws is available from the University of Berkeley Terner Center for Housing Innovation's "Database Of California Housing And Land Use Laws", as provided at this website: <https://ternercenter.berkeley.edu/california-land-use-housing/ >.

Table A-C-1: Partial List of New Housing Laws in California (2017 to 2023)	
Informal Name	***Description***
Senate Bill 9	May allow up to four units of housing on a single-family lot. SB 9 does not apply in historic districts or environmentally sensitive areas, like wetlands and certain high fire-risk areas.
Senate Bill 10	Creates a voluntary program that makes it easier for cities to upzone any urban or transit-adjacent parcel of land, including a single-family lot, to allow a building of 10 units or fewer. (2021)
Assembly Bill 2011 (Wicks)	Creates a pathway for residential development on sites otherwise exclusively locally zoned for commercial use (passed in 2022).
Senate Bill 423 **–** (Wiener)	Extends and expands existing law, requiring local governments that fail to meet state housing planning goals to streamline affordable housing projects. This will increase affordable housing throughout the state in uncooperative cities. (2023)
Senate Bill 4 **-** (Wiener)	Allows housing to be developed on property owned by religious or independent higher education institutions. These groups are given this authority "by right," which requires no discretionary local governance intervention. (2023)
AB2011 - The Affordable Housing and High Road Jobs Act (Wicks). Chapter 647, Statutes of 2022 for Section	Identifies areas zoned for parking, retail, or office buildings where land could be used for housing. It also allows for housing on that land and exempts such projects from local approval processes and the California Environmental Quality Act.

65400 of the Government Code	
Senate Bill 6. (Caballero)	Allows more housing to be built in commercial corridors zoned for retail and office buildings. They also guarantee high union wages for construction workers and promise an expedited building process near city centers to avoid sprawl.
AB 12 by Assemblymember Matt Haney (D-San Francisco)	Tenancy: security deposits.
AB 84 by Assemblymember Christopher Ward (D-San Diego)	Property tax: welfare exemption: affordable housing.
AB 12 by Assemblymember Matt Haney (D-San Francisco)	Tenancy: security deposits.
AB 84 by Assemblymember Christopher Ward (D-San Diego)	Property tax: welfare exemption: affordable housing.
AB 281 by Assemblymember Tim Grayson (D-Contra Costa)	Planning and zoning: housing: post entitlement phase permits.
AB 318 by Assemblymember Dawn Addis (D-Morro Bay) –	Mobile Home Residency Law Protection Act.
AB 319 by Assemblymember Damon Connolly (D-San Rafael)	Mobile Home Parks Act: inspectors: conflict of interest: enforcement actions: sunset.
AB 323 by Assemblymember Chris Holden (D-Pasadena)	Density Bonus Law: purchase of density bonus units by nonprofit housing organizations: civil actions.
AB 346 by Assemblymember Sharon Quirk-Silva (D-Fullerton)	Income tax credits: low-income housing: California Debt Limit Allocation Committee rulemaking.
AB 434 by Assemblymember Tim Grayson (D-Contra Costa)	Housing element: notice of violation.
AB 480 by Assemblymember Philip Ting (D-San Francisco)	Surplus land.
AB 516 by Assemblymember James Ramos (D-San Bernardino)	Mitigation Fee Act: fees for improvements: reports and audits.
AB 519 by Assemblymember Pilar Schiavo (D-Los Angeles)	Affordable Housing Finance Workgroup: affordable housing: consolidated application and coordinated review process.
AB 529 by Assemblymembers Jesse Gabriel (D-Encino)-	Adaptive reuse projects.
AB 548 by Assemblymember Tasha Boerner (D-San Diego)	State Housing Law: inspection.
AB 572 by Assemblymember Matt Haney (D-San Francisco)	Common interest developments: the imposition of assessments.
AB 671 by Assemblymember Christopher Ward (D-San Diego)	CalHome Program: accessory dwelling units.

AB 812 by Assemblymember Tasha Boerner (D-San Diego)	Housing development approvals: reserving affordable units in or near a cultural district for artists.
AB 821 by Assemblymember Tim Grayson (D-Contra Costa)	Planning and zoning: general plan: zoning ordinance: conflicts.
AB 894 (Friedman)	Parking requirements: shared parking.
AB 911 (Schiavo)	Unlawfully restrictive covenants: affordable housing.
AB 976 (Ting)	Accessory dwelling units: owner-occupancy requirements.
AB 1033 (Ting)	Accessory dwelling units: local ordinances: separate sale or conveyance.
AB 1114 (Haney)	Planning and zoning: housing development projects: post entitlement phase permits.
AB 1218 (Lowenthal)	Development projects: demolition of residential dwelling units.
AB 1287 (Alvarez)	Density Bonus Law: maximum allowable residential density: additional density bonus and incentives or concessions.
AB 1308 (Quirk-Silva)	Planning and Zoning Law: single-family residences: parking requirements.
AB 1317 (Carrillo)	Unbundled parking.
AB 1319 (Wicks)	Bay Area Housing Finance Authority: housing revenue.
AB 1332 (Carrillo)	Accessory dwelling units: pre-approved plans.
AB 1386 (Gabriel)	Veterans housing: tenant referrals.
AB 1449 (Alvarez)	Affordable housing: California Environmental Quality Act: exemption.
AB 1474 (Gómez Reyes)	California Statewide Housing Plan.
AB 1485 (Haney)	Housing element: enforcement: Attorney General.
AB 1490 (Lee)	Affordable housing development projects: adaptive reuse.
AB 1508 (Ramos)	Department of Housing and Community Development: California Statewide Housing Plan.
AB 1528 (Gipson)	Housing authorities: property taxation.
AB 1620 (Chavez Zbur) –	Costa-Hawkins Rental Housing Act: permanent disabilities: comparable or smaller units.
AB 1633 (Ting)	Housing Accountability Act: disapprovals: California Environmental Quality Act.
AB 1734 (Byron Jones-Sawyer Sr.)	Local Government: Surplus Land Act: exemptions.
AB 1764	By the Committee on Housing and Community Development – Housing omnibus.
SB 4(Wiener)	Planning and zoning: housing development: higher education institutions and religious institutions.
SB 34 (Umberg)	Surplus land disposal: violations: County of Orange.
SB 82 (Seyarto)	Property taxation: disabled veterans' exemption: eligibility letters.
SB 229 (Umberg)	Surplus land: disposal of property: violations: public meeting.
SB 240 (Ochoa Bogh)	Surplus state real property: affordable housing and housing for formerly incarcerated individuals.
SB 267 (Talamantes Eggman)	Credit history of persons receiving government rent subsidies.
SB 341 (Becker)	Housing development.

SB 423 (Wiener)	Land use: streamlined housing approvals: multifamily housing developments.
SB 439 (Skinner)	Special motions to strike: priority housing development projects.
SB 482 (Blakespear)	Multifamily Housing Program: supportive housing: capitalized operating reserves.
SB 520 (Seyarto)	Property taxation: homeowners' exemption.
SB 593 (Wiener)	Redevelopment: successor agency debt: City and County of San Francisco.
SB 684 (Caballero)	Land use: streamlined approval processes: development projects of 10 or fewer residential units on urban lots under 5 acres.
SB 713 (Padilla)	Planning and zoning: density bonuses: development standard.
SB 734 (Rubio)	Property tax: possessory interests.
SB 747 (Caballero)	Land use: surplus land.
SB 789 (Allen)	Elections: Senate Constitutional Amendment 2 of the 2021–22 Regular Session and Assembly Constitutional Amendment 5 of the 2023–24 Regular Session.
Data Source: California Press Release, Published: Oct 11, 2023. See *https://www.gov.ca.gov/2023/10/11/governor-newsom-signs-package-to-streamline-housing-and-expand-tenant-protections-in-california/*	

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- *https://www.latimes.com/opinion/story/2023-10-13/california-housing-crisis-2023-bills*
- *https://www.latimes.com/opinion/story/2021-09-17/newsom-housing-sb9*
- *https://ternercenter.berkeley.edu/wp-content/uploads/2022/07/ADU-Paper-FINAL-July-7th.pdf*
- *https://ternercenter.berkeley.edu/research-and-policy/state-law-local-interpretation-senate-bill-9/*
- *https://ternercenter.berkeley.edu/wp-content/uploads/2023/04/New-Pathways-to-Encourage-Housing-Production-Evaluating-Californias-Recent-Housing-Legislation-April-2023-Final-1.pdf*
- *https://ternercenter.berkeley.edu/research-and-policy/ab-2011-commercial-zones/*

Appendix E

Housing and Land Use Resources and Databases

Appendix E: Housing and Land Use Resources and Databases

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Contra Costa County, like all counties in the California, is facing a housing shortage and high housing prices. This appendix provides a brief summary of a few on-line databases that provide information about housing in Contra Costa County (including its cities).

To study and summarize some of the details associated with housing and land-use in Contra Costa County, this appendix queried several federal and state on-line databases developed by agencies that collect geographic data. These agencies routinely collect new data and update their databases accordingly. Therefore, in order to obtain the most recent data, LAFCO's planners and the general public are encouraged to view the databases directly on-line and the URL's are provided in the following paragraphs below the discussion of each database. These on-line databases describe detailed information about a variety of metrics including infrastructure vulnerability, population demographics, and the built environment. LAFCO is particularly interested in data regarding disadvantaged communities.

E-1: Housing Density in Contra Costa County

Contra Costa County contains a unique mix of urban, suburban, and open space areas. Local governments and LAFCO have worked together to protect agriculture and open space in the County. However, in the cities, urban design and the development process can be a bit tricky to implement successfully. Some cities have general plans that seek to add more density to promote economic revitalization and affordable housing. However, in other cities and communities housing density is viewed as a negative trend because if facilities more and bigger buildings, more asphalt and concrete, fewer trees and green space, less sunlight, and encroachment on privacy. Local governments resolve these tradeoffs through zoning ordinances that regulate housing density. For

example, single-family districts typically include lot size minimums. Multifamily zoning districts may suggest a minimum or maximum number of dwelling units allowed per acre.

Land in Contra Costa County is finite and limited. Approval of new sprawling development will likely be limited in the future. Trends toward transit-oriented housing will likely continue. Increased housing density can save land and energy use, and may cost less for infrastructure development and maintenance. For example, infrastructure costs per capita may be lower in high-density areas. As the County and local cities continue to study the opportunities and constraints associated with housing density, they will gain insight into the economic reality of urban development.

To consider housing density in Contra Costa County, this appendix studies the number of Housing Units Per Acre as described in the U.S. EPA Smart Locations Database[1]. The Smart Location Database summarizes several demographic, employment, and built environment variables for every census block group (CBG) in the United States. The database includes indicators regarding residential and employment density, land use diversity, design of the built environment, access to destinations, and distance to transit. Figure A4-1, below, shows the most recent geographic boundaries (2019 Census Block Groups) and new and expanded sources of data used to calculate variables from this database (EPA, 2013 as updated in 2022). Figure A4-x shows housing density as a function of the number of units per acre. As shown in the map legend, housing density is color-ramped such that lower density areas have a light-yellow color and higher density areas are shown in dark brown. For example, Census Block Group 060133100001 in the City of Pittsburg near the railroad tracts is colored dark brown in the map, indicating a relatively higher housing density. Antioch's Census Block Groups 060133050005 and 060133072021 also have higher housing density (EPA, 2013 as updated in 2022).

Readers are encouraged to look up the most recent data directly through the online databases as provided on the following websites:

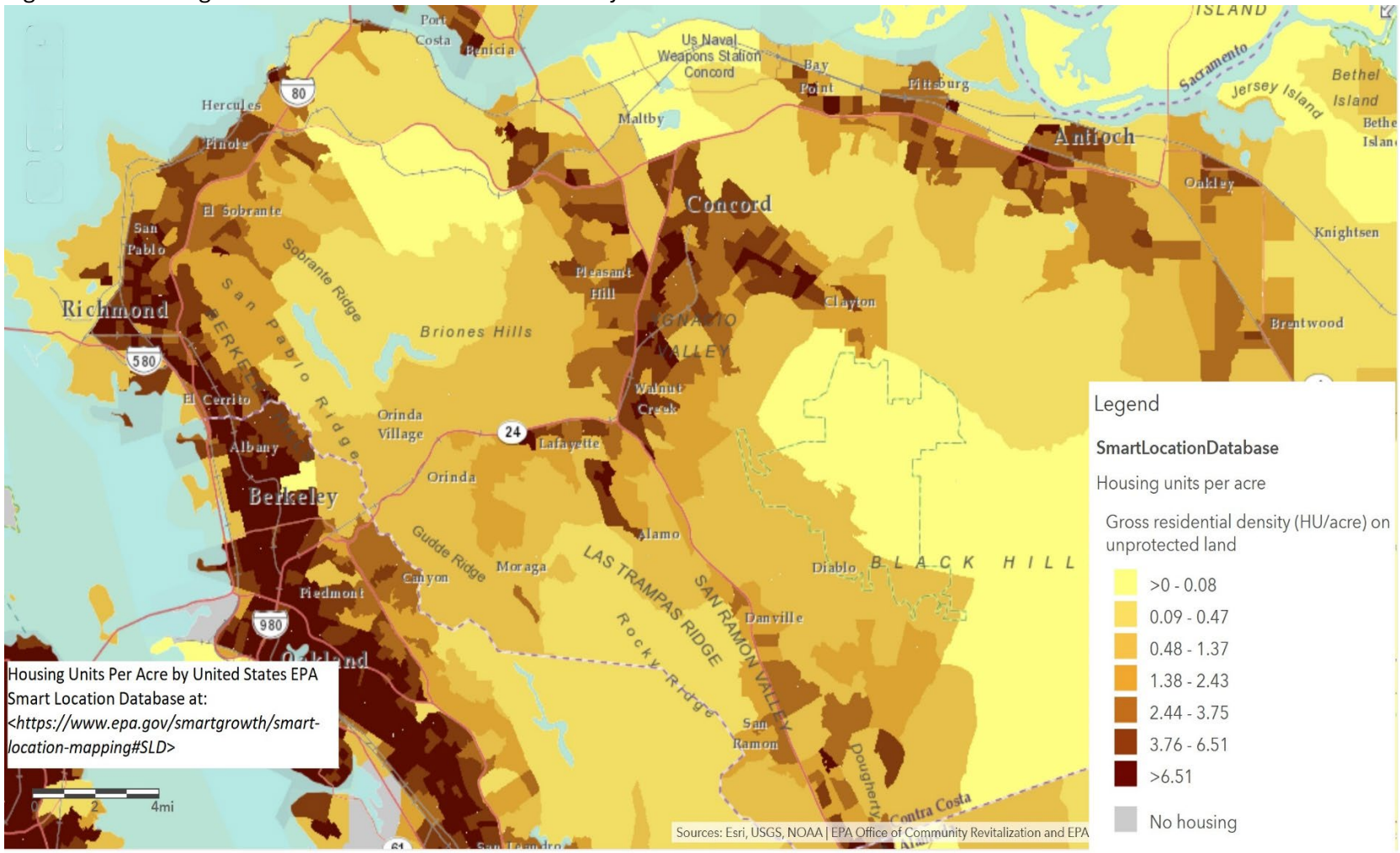
- *https://www.epa.gov/smartgrowth/smart-location-mapping#SLD*

or

- *https://epa.maps.arcgis.com/home/webmap/viewer.html?webmap=137d4e512249480c980e00807562da10*

[1] The U.S. EPA Smart Locations Database can show several variables related to the built environment, including land use, public transit service, and accessibility to destinations summarized for all census block groups in the U.S. See *https://www.epa.gov/smartgrowth/smart-location-mapping* for more information.

Figure E-1: Housing Units Per Acre in Contra Costa County

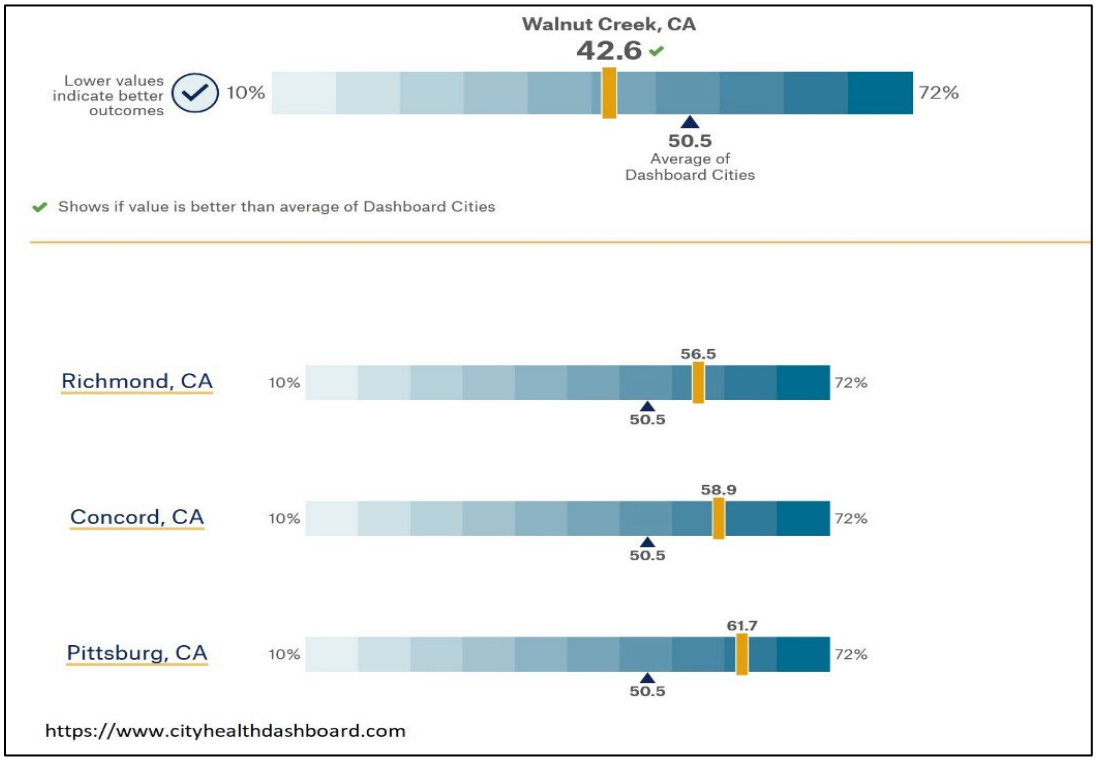


Data Source: United States EPA Smart Location Database at: <*https://www.epa.gov/smartgrowth/smart-location-mapping#SLD*>

E-2: Rent Burden

LAFCO considers disadvantaged communities and environmental justice issues as part of its responsibility under the CKH Act. Members of these communities may experience a heavy financial burden associated with paying rent. To study this issue, an online database was queried called "The City Health Dashboard". This Dashboard utilizes over 40 measures of health and drivers of health in larger-sized cities to help community leaders and residents pinpoint and take action on gaps in health and opportunity. The City Health Dashboard was compiled by the Department of Population Health at New York University (NYU) Langone Health and the Robert F. Wagner School of Public Service at NYU as a health improvement planning resource. The Dashboard allows one to view and compare data from multiple sources on health and the factors that shape health to guide local solutions. A wide range of factors influence how long and how well we live from education and income to the quality of our housing and the safety of our neighborhoods. In this section, the query results from two topics are shown below: 1) Rent burden

As shown in Figure x below, the City of Concord had an estimated 58.9% of households experiencing high rent burden in 2021, compared to an average of 50.5% across the Dashboard's cities. Walnut Creek had the lowest percent of households experiencing a rent burden at only 42.6 percent.



E-3: National Walkability Index

EPA's National Walkability Index provides walkability scores based on a simple formula that ranks selected indicators that affect the propensity of walk trips. Walkability depends upon characteristics of the built environment that influence the likelihood of walking being used as a mode of travel.

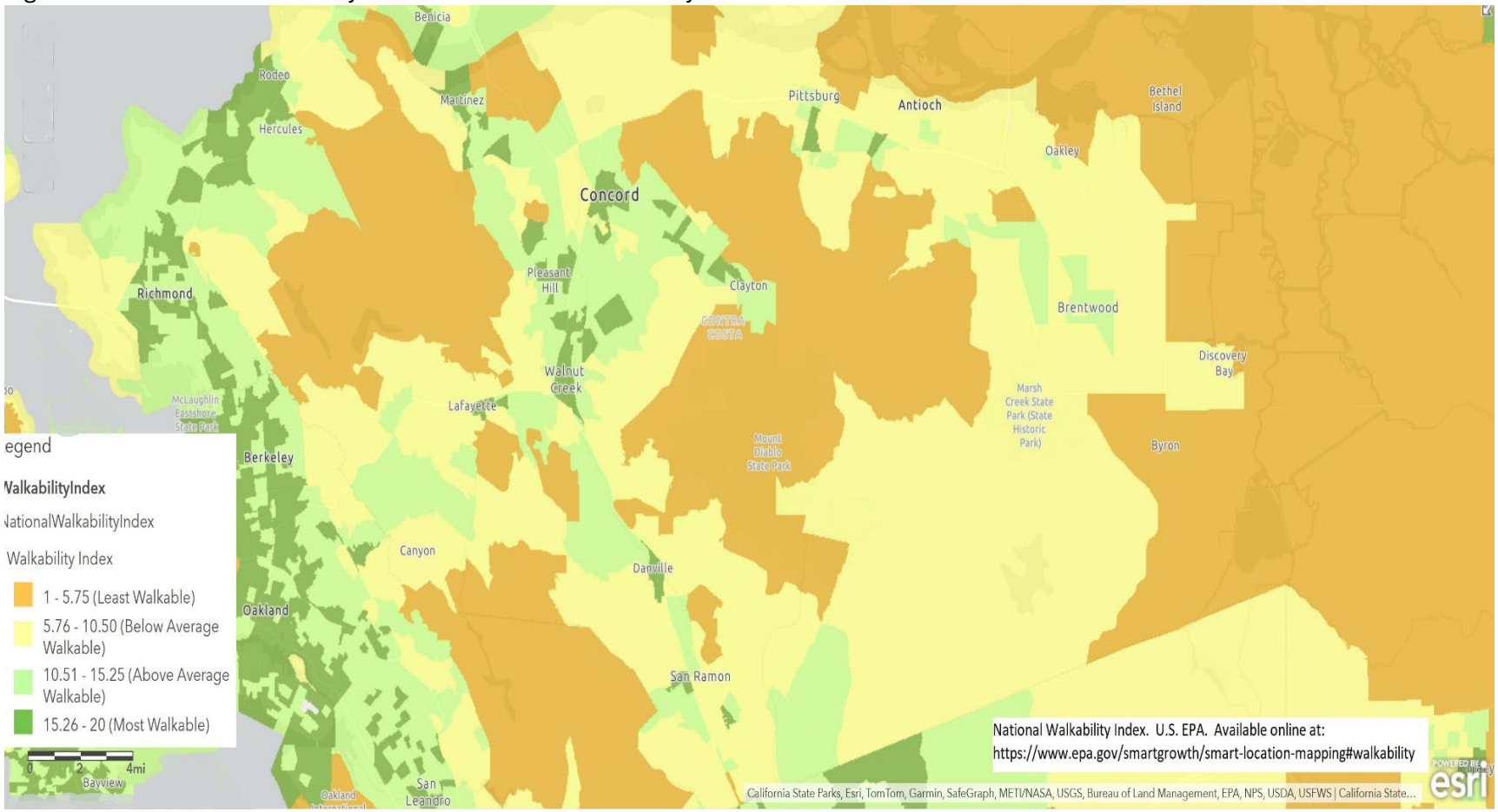
Or
The dataset covers every Census 2019 block group in the nation, providing a basis for comparing walkability from community to community. The National Walkability Index dataset ranks each block group relative to all other block groups in the United States, but individuals can use downloadable data to construct an index for a smaller universe of block groups, like a state, metropolitan area, or city. In Figure 2-x below, the dark green areas show those portions of Contra Costa County that are most walkable including areas of Richmond, Hercules, Martinez, Walnut Creek, and Concord. The orange-colored areas depict geographic locations that are the least walkable and these include specific neighborhoods in Martinez, Byron, and Discovery Bay. The City of Martinez contains neighborhoods that are ranked most walkable and other neighborhoods that are ranked least walkable. Neighborhood walkability data will be more useful to LAFCO when used in the context of understanding the total package of infrastructure available to disadvantaged communities. Readers are invited to learn more about the walkability index on these websites:

- https://www.epa.gov/smartgrowth/smart-location-mapping#walkability
- https://epa.maps.arcgis.com/home/webmap/viewer.html?webmap=f16f5e2f84884b93b380cfd4be9f0bba

Reference

U.S. Environmental Protection Agency (EPA). Office of Sustainable Communities. May 13, 2021 (publication). National Walkability Index. On-line Database. Retrieved January 20, 2024 from: <*https://www.epa.gov/smartgrowth/smart-location-mapping#walkability*>.

Figure E-2- National Walkability Index for Contra Costa County

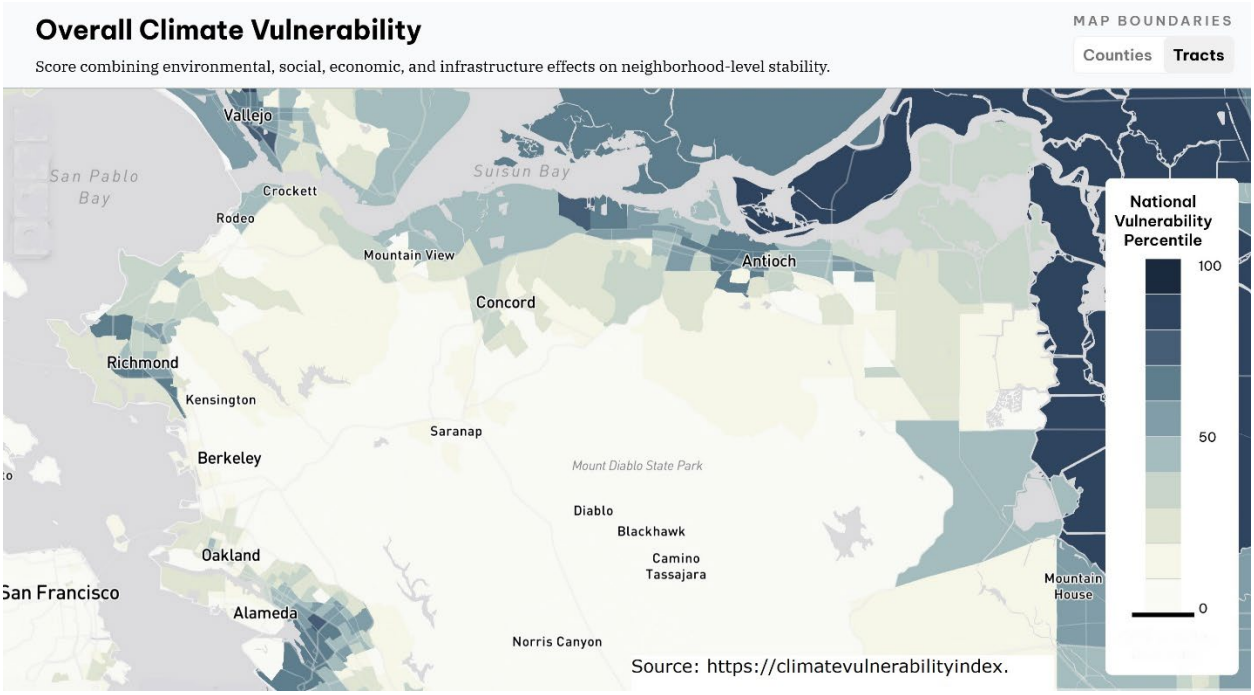


E-4: Climate Vulnerability Index

The CKH Act requires LAFCO to evaluate environmental justice issues when considering a proposal. The ramifications from climate change are a threat to everyone's financial situation, health, air, water, food, and shelter. However, communities that are socially or economically disadvantaged may face the greatest risks. Due to their location, income, health, language barriers, and limited access to resources their risk of exposure to disasters caused by or inflated by climate change is higher. In the U.S., these more vulnerable communities are largely the communities of color, immigrants, low-income communities, and people for whom English is not their native language. As time goes on, they will likely suffer the worst impacts of climate change and associated sea level rise. Therefore, it is important to recognize that environmental justice and climate change are linked.

The Climate Vulnerability Index was developed by Texas A&M University in collaboration with numerous other partners. This index provides a robust, data-driven approach to understanding locally relevant determinants at a neighborhood scale. The index pulls in 184 datasets to rank more than 70,000 U.S. Census tracts and this mapping tool integrates cumulative impacts. The index compiles climate impacts at the census tract level, both historical and projected, direct, and indirect – integrating climate change impacts with environmental, health, and socioeconomic metrics. Additional details about the methodology used to create the Climate Vulnerability Index can be found on its website at: <*https://climatevulnerabilityindex.org/*>. Figure 2-x below shows the spatial distribution of areas that may be vulnerable to climate change impacts. Darker colors represent higher vulnerability.

Figure E-3: Climate Vulnerability Index



Most of the areas within Contra Costa County that may be vulnerable to climate change impacts are

located near the shoreline. In particular, the Bay Point neighborhood (Census Tract 06013314200) scores in the 73rd percentile, indicating a high level of vulnerability. Additionally, a neighborhood in Richmond (Census Tract 06013365002) scored in the 68th percentile, indicating a moderate to high level of vulnerability

Reference

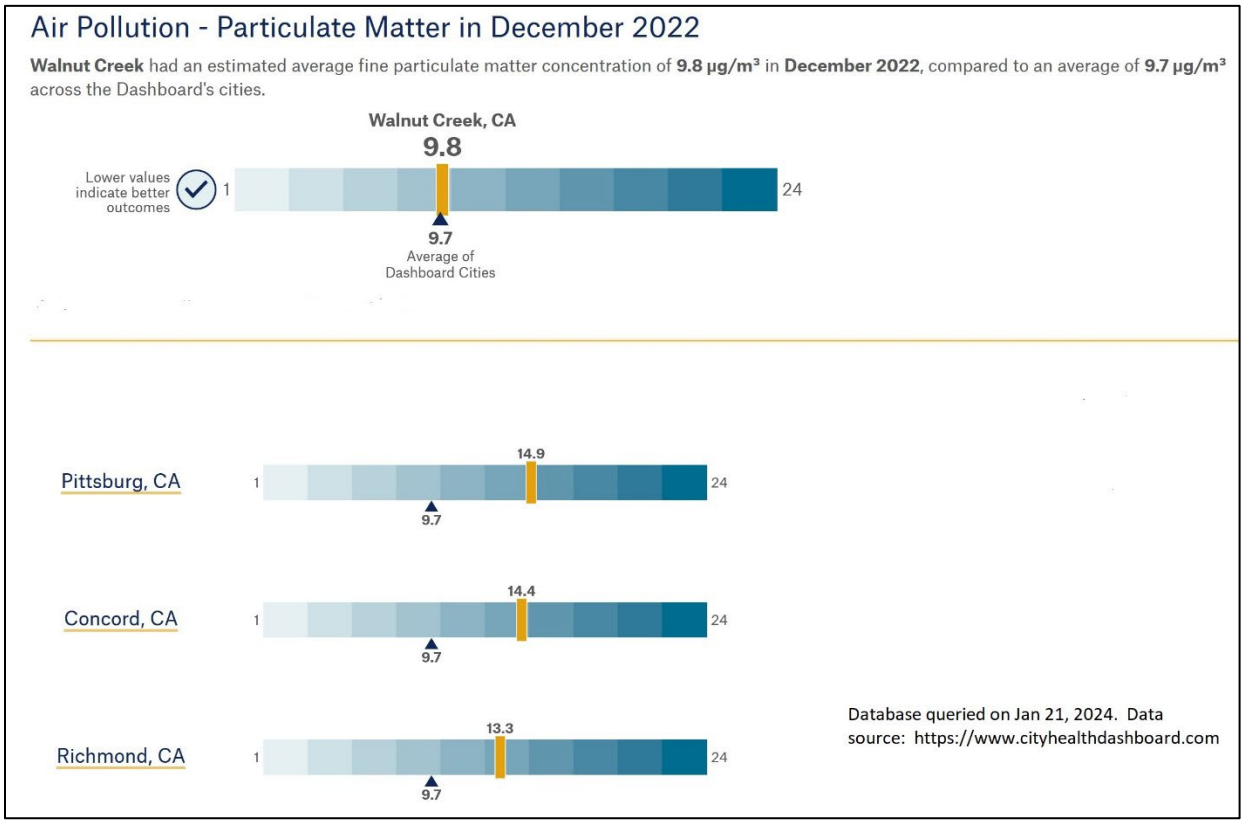
Texas A&M University, Environmental Defense Fund, and Darkhorse Analytics. 2023. The U.S. Climate Vulnerability Index. Retrieved on November 20, 2023 from <*https://climatevulnerabilityindex.org* >.

E-5: Air Pollution Comparison

NYU's City Health Dashboard was queried for an air pollutant called particulate matter. Of the four cities studied, the City of Pittsburg had the highest level with an estimated fine particulate matter concentration of 14.9 *u*g/m^3 in December 2022. Query results for the four studied cities are shown in Figure x below.

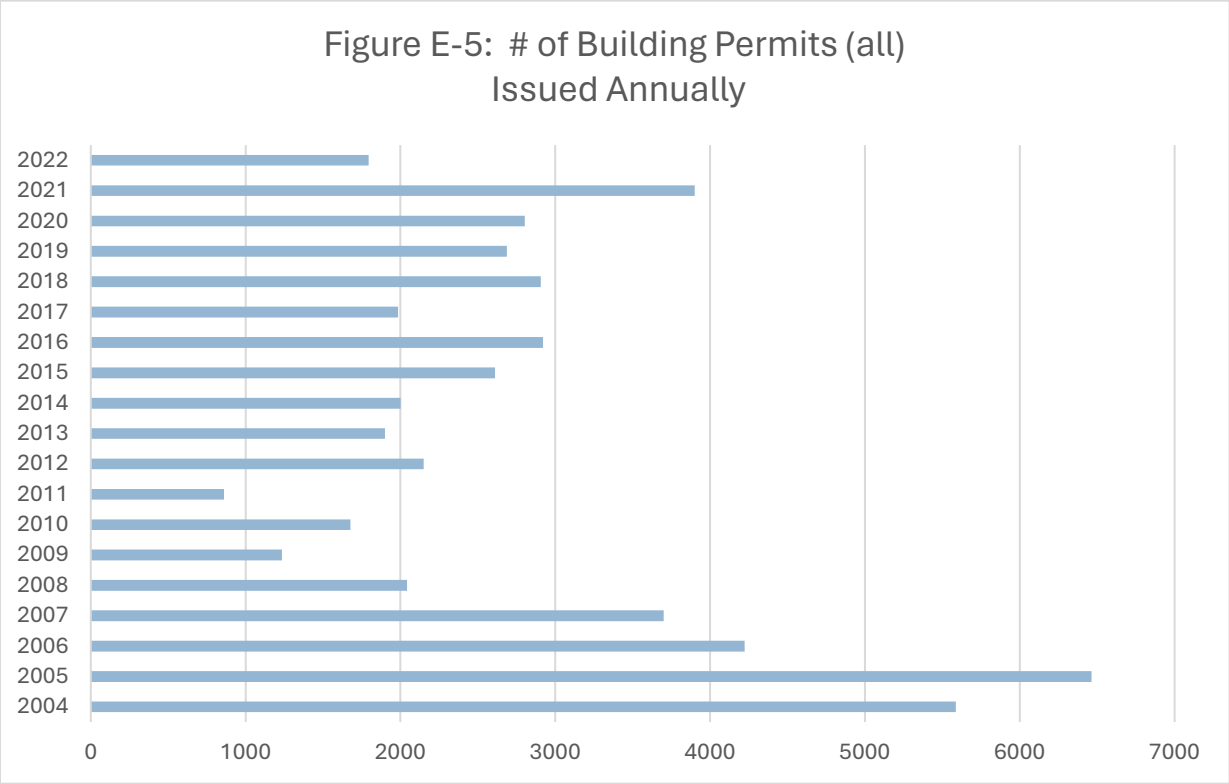
Reference

New York University (NYU) Department of Population Health at Langone Health and the Robert F. Wagner School of Public Service. December 2022. City Health Dashboard. Retrieved on January 21, 2024 from: < https://www.cityhealthdashboard.com>.



E-6: Number of Building Permits

When considering future growth of an area, it is helpful to understand the number of building permits issued. The United States Department of Housing and Urban Development, HUD Office of Policy Development and Research compiles a dataset of Residential Construction Permits by County. This dataset contains data on permits for residential construction collected in the Census Bureau's Building Permits Survey. Data is aggregated to the county level. An eighteen-year time period is shown in Figure x below. In the year 2021, officials within Contra Costa County issued 3,901 building permits. The fewest building permits were issued in 2022 at only 1,794 building permits.



Data Source for Figure x, above is United States Department of Housing and Urban Development

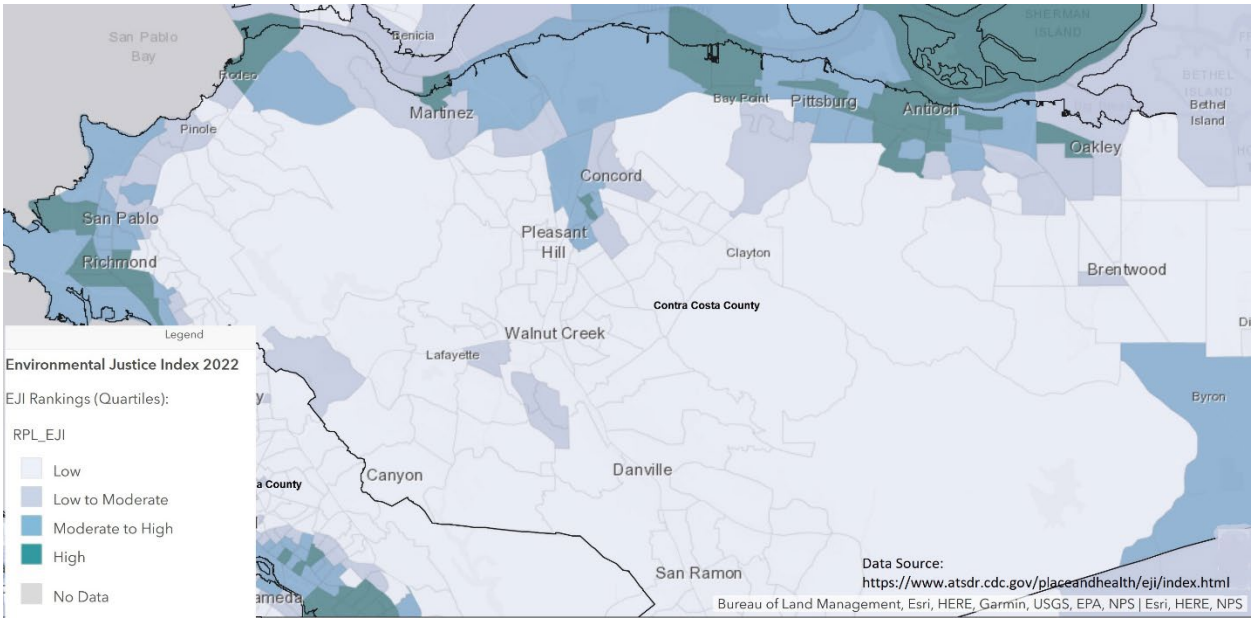
A statistical analyisis was not done on the data shown in Figure x above. However, it seems that more building permits were issued during the years 2004 to 2007, prior to the recession of 2008.

Reference

United States Department of Housing and Urban Development, HUD Office of Policy Development and Research. Date created: 11/18/2020. Date updated: 11/16/2023. Dataset of Residential Construction Permits by County from Geospatial Data Storefront. Retrieved on January 21, 2024 from: <*https://hudgis-hud.opendata.arcgis.com/*>.

E-7: Disadvantaged Communities

The U.S. Department of Health and Human Services (HHS) manages a database of socioeconomic and health indicators in disadvantaged communities called the Environmental Justice Explorer Database. This database was queried for the Contra Costa County. Query results indicate that disadvantaged communities in the Contra Costa area may experience hardships. Readers are invited to query this database for specific areas at: <https://www.atsdr.cdc.gov/placeandhealth/eji/index.html >.



This database provides details regarding the census tracts rated in the Env Justice Index. For example, a small census tract located within the City of Martinez (Census Tract 3160) has an area rated as "high". Details are provided in Table x below.

Location	Census Tract 3160, Contra Costa County, California (City of Martinez)
Total Population in Census Tract	1,055
EJI Rank	⚠0.79
Environmental Burden Rank	⚠0.80
Potentially Hazardous & Toxic Sites	**⚠0.95**
Toxic Release Inventory Sites	⚠0.84
Treatment, Storage, and Disposal Sites	⚠0.93
Risk Management Plan Sites	⚠0.82
Built Environment	**0.19**
Housing Built Pre-1980	⚠0.81
Transportation Infrastructure	**0.55**
Railways	⚠0.79

Socioeconomic Status	**0.66**
Poverty	⚠0.92
No High School Diploma	⚠0.79
Housing Tenure	⚠0.96
Housing Burdened, Lower-Income Households	⚠0.97
Household Characteristics	**⚠0.76**
Civilian with a Disability	⚠0.99
Speaks English "Less than Well"	⚠0.83
Housing Type	**0.62**
Group Quarters	⚠0.95
High Pre-existing Chronic Disease Prevalence Sum	2 out of 5
High Estimated Prevalence of Asthma	Yes⚠
High Estimated Prevalence of Poor Mental Health	Yes⚠

In this census tract, a proportion of the area is within 1-mi buffer of a railway. This is why Table lists 0.79 (i.e. 79 percent) and gives it a red flag. Like roads, railways can also present a significant source of noise pollution to nearby communities. This noise pollution can constitute a major annoyance and source of community stress, especially when combined with noise pollution from traffic (Öhrström et al., 2007). Among all transportation-associated sources of noise pollution, railway noise is associated with the most significant levels of sleep disruption and associated increases in stress and diastolic blood pressure (Elmenhorst et al., 2019; Petri et al., 2021).

References

U.S. Department of Health and Human Services Office of Environmental Justice. 2023. Environmental Justice Index (EJI) Explorer. Retrieved on September 25, 2023 from <*https://onemap.cdc.gov/portal/apps/sites/#/eji-explorer*>.

U.S. EPA Office of Community Revitalization/Smart Growth Program. Item created: Sep 6, 2013 Item updated: Feb 16, 2022. Smart Locations Database, Housing Units Per Acre (variable). Retrieved on January 20, 2024 from < https://www.epa.gov/smartgrowth/smart-location-mapping#SLD>.

List of Appendix F

Description of Watersheds

Appendix F

Description of Watersheds
Contra Costa County, CA

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Introduction – Watersheds Basics

Watershed management plans are noted as an important part of the regional context for a MSR in the 2003 OPR LAFCO Municipal Service Review Guidelines. Drainage basins[1] are mentioned in the CKH Act [GC §56668 (a)]. A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. In Contra Costa, all water eventually drains into the San Francisco Bay/Sacramento Delta Estuary. The watershed includes surface water in streams, rivers, lakes, ponds, and the groundwater in local aquifers. The drinking water that comes out of our taps comes from all these sources. Watersheds are shaped by the natural contours of the land: hills and valleys. Think of a watershed as a basin, formed by the highest ridges surrounding a network of streams. Every raindrop falling inside these high points drains into the watershed.

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

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

Water Cycle

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

[1] Factors to be considered in the review of a proposal shall include, but not be limited to, all of the following: (a) Population and population density; land area and land use; assessed valuation; topography, natural boundaries, and drainage basins; proximity to other populated areas; and the likelihood of significant growth in the area, and in adjacent incorporated and unincorporated areas, during the next 10 years (CKH Act, GC §56668 (a).

land to the atmosphere. The water cycle is a system that is energized by the sun and involves the continuous exchange of moisture between the ocean, the atmosphere, and the land (NASA, n.d.).

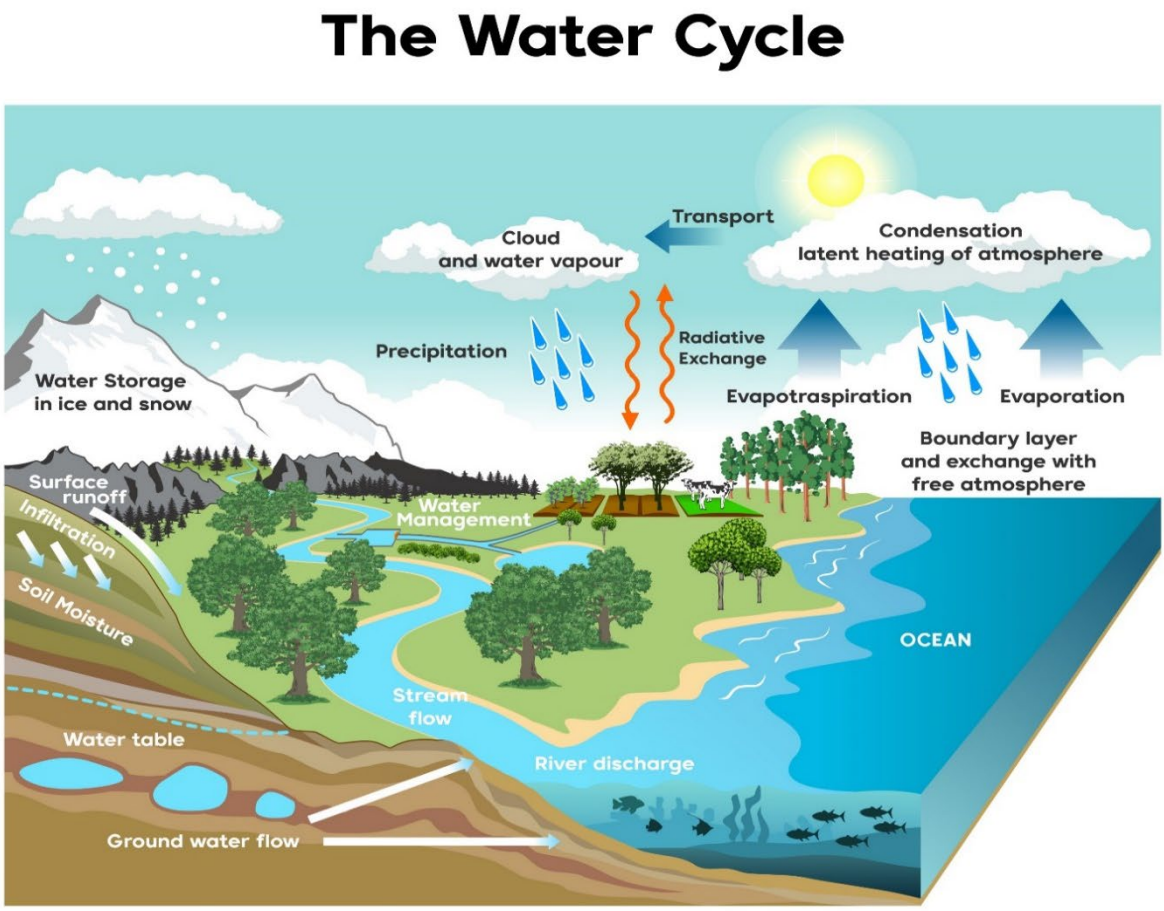


Figure F-1: The Water Cycle

The greater San Franciso Bay and Sacramento/San Joaquin Estuary watershed is comprised of water that drains from the entire western slope of the Sierra, the eastern slope of the Coast Ranges and the south- and west-facing drainages of Mount Shasta and Lassen Peak. Water in the Sacramento/San Joaquin rivers flows through the Delta, into San Francisco Bay, and out through the Golden Gate. This natural system is massive and geographically diverse, including some of the highest mountains and the largest agricultural valleys on the continent.

Watershed Management

Wastewater districts, drinking water districts, private property owners, public land management agencies, stormwater management experts, environmental specialists, land-use planning regulators, and communities all play an integral part in watershed management. Land managers and property owners within the watershed often collaborate to protect watershed health and water quality. Non-profits conservation groups recognize that watershed health is important to their mission. Ideally watershed management would be aimed at creating and implementing plans, programs and projects to sustain and enhance watershed functions that affect the plants, animals, and human communities within the watershed boundary. Features of a

watershed that agencies seek to manage include water supply, water quality, drainage, stormwater runoff, water rights and the overall planning and utilization of watersheds.

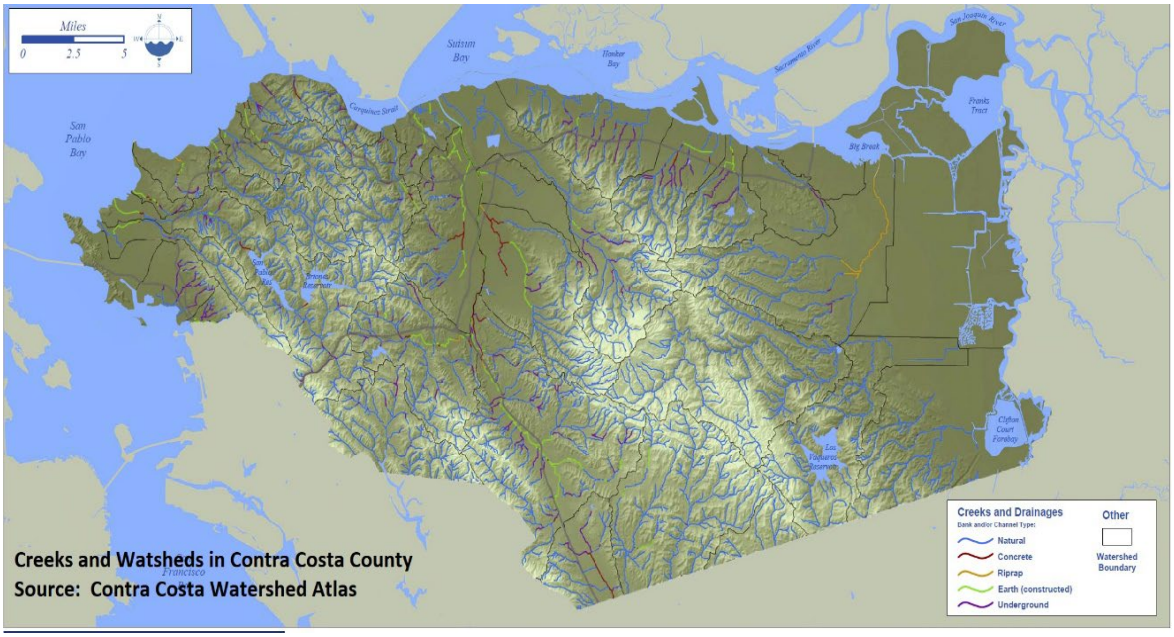
Contra Costa Watersheds

Contra Costa County has 31 major watersheds and sub-watersheds that drain to the Bay or Delta as listed below and as shown in Figure F-2.

Contra Costa County Watersheds

- Baxter, Cerrito, and West Richmond Watersheds
- Wildcat Creek Watershed
- San Pablo Creek Watershed
- Rheem and Garrity Creek Watersheds
- Pinole Creek Watershed
- Refugio, Rodeo, and Carquinez Area Watersheds
- Alhambra Creek and Peyton Slough Watersheds
- Walnut Creek Watershed
- Mount Diablo Creek Watershed
- Willow and Kirker Creek Watersheds
- East and West Antioch Creek Watersheds
- Marsh Creek Watershed
- East County Delta Drainages
- Kellogg and Brushy Creek Watersheds
- Upper Alameda Creek Watershed
- Upper San Leandro and Moraga Creek Watershed

Figure F-2: Watersheds in Contra Costa County



The watersheds in Contra Costa County contain more than 1,300 miles of creeks and drainages. All but eight of these watersheds are entirely within Contra Costa County. The largest watersheds in Contra Costa County are Walnut Creek (93,556 acres), San Ramon Creek (tributary to Walnut Creek, 32,915 acres), and San Pablo Creek (27,640 acres). The County also includes the upper portion of the Alameda Creek watershed, which is one of the most important watersheds in the Bay Area for both public drinking water supply and wildlife habitat.

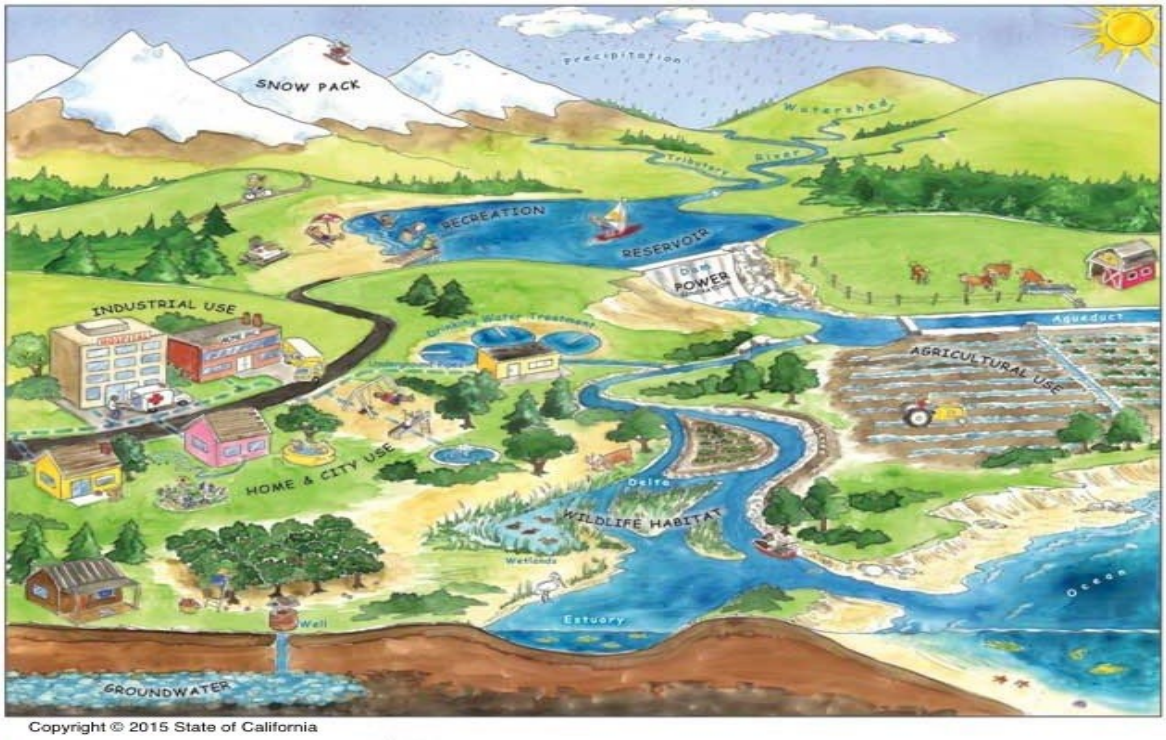


Figure F-3: Typical Community Near State Water Project Infrastructure

The CA Department of Water Resources prepared Figure F-3, to depict a typical northern California community that supplies water to the State Water Project.

Watershed Management Organizations

Integrated water management plans and activities are often sponsored by local non-profit organizations. A collaborative effort across agencies, government, and NGOs is essential for proper stewardship on a watershed-wide basis.

Contra Costa Clean Water Program

The Contra Costa Clean Water Program (CCCWP) is a county agency, and they maintain a website at: *https://www.cccleanwater.org/*. This agency also publishes a watershed atlas that is available as a pdf file to download from their website. The CCCWP has 21 member agencies that receive support on the implementation of local stormwater pollution prevention activities (CCCWP, n.d.). CCCWP funds and directs regional and statewide stormwater-related programs and groups (CCCWP, n.d.). Additionally, CCCWP assists permittees to maintain compliance with the MRP (CCCWP, n.d.).

Contra Costa County Watershed Program

The Contra Costa County Watershed Program is a county agency, and they maintain a website at: *https://www.contracosta.ca.gov/344/Contra-Costa-County-Watershed-Program.* The County Watershed Program (CWP) ensures that the County of Contra Costa complies with its municipal stormwater National Pollutant Discharge Elimination System (NPDES) permits (Contra Costa County, n.d.). The CWP currently has the Municipal Regional Permit (MRP) and the East Contra Costa County Permit (Contra Costa County, n.d.).

Contra Costa Watershed Forum

The Contra Costa Watershed Forum (CCWF) is an open committee, and it maintains a website at: *https://www.ccwatershedforum.org/*. The committee includes around fifty organizations, and it is based on the idea that broad cooperation is needed to impact change (CCWF, n.d.). The organizations collaborate to ensure that water resources are healthy, functional, and safe (CCWF, n.d.).

Watershed Project

The Watershed Project is a nonprofit, and it maintains a website at: *https://app.thewatershedproject.org/*. The Watershed Project is an organization of community groups and volunteers that monitor the health within the creeks of the County of Contra Costa. The nonprofit follows the California Waterboards Surface Water Ambient Monitoring Program monitoring and assessment (The Watershed Project, n.d.). The nonprofit encourages that volunteers help collect monthly data for monitoring purposes (The Watershed Project, n.d.).

Contra Costa Resource Conservation District

The Contra Costa Resource Conservation District (CCRCD) is a non-regulatory special district, and it maintains a website at: *https://www.ccrcd.org/watersheds*. The Contra Costa RCD is governed by a Board of Directors that are appointed by the County Board of Supervisors (CCRCD, n.d.). The CCRCD is an active agent that helps support natural systems to maintain clean water, clean air, and healthy soils (CCRCD, n.d.). The Contra Costa RCD does cleanups, environmentally focused discussions, webinars, and contributes to watershed restoration.

San Francisco Estuary Partnership

The San Francisco Estuary Partnership is a collaboration amongst local, state, and federal agencies, NGOs, academic leaders, and business leaders (SFEP, n.d.). The Partnership maintains a website at: *https://www.sfestuary.org/about-us/*. The Partnership's work is guided by the implementation of the Estuary Blueprint (SFEP, n.d.). The Partnership manages various multi-beneficial projects that improve the health of the Estuary (SFEP, n.d.).

San Francisco Estuary Institute

The San Francisco Estuary Institute (SFEI) is an aquatic and ecosystem science institute and they maintain a website at: *https://www.sfei.org/*. The SFEI provides scientific support and tools to improve the health of the waters, wetlands, wildlife, and landscapes of the San Francisco Bay and other areas (SFEI, n.d.). The experts and scientists in the SFEI provide data, technology, and tools that inspire government, civic, and business leaders to create solutions for complex environmental issues (SFEI, n.d.).

San Francisco Baykeeper

The San Francisco Bay Keeper is an environmental advocacy nonprofit, and it maintains a website at: *https://baykeeper.org/*. Since 1989, the San Francisco Baykeeper has taken action to defend the Bay and its watershed (San Francisco Baykeeper, n.d.). The San Francisco Baykeeper patrols on the water, investigates pollution, and helps strengthen laws that protect the Bay (San Francisco Baykeeper, n.d.).

Algal Blooms

During July 2022, there was a report of an algal bloom within the Oakland Estuary that eventually spread to the South Bay and became expansive (SFEI, 2022). As time passed, fish mortality events were observed as

researchers and residents studied the bloom (SFEI, 2022). Algae is a simple organism that can live in water and can grow uncontrollably into patches (Bartlett et al., 2022). The harmful algae, *Heterosigma akashiwo*, experienced unprecedented bloom in the San Francisco Bay estuary during 2022. The *Heterosigma akashiwo* is an invasive species that has toxic impacts on fish (SFEI, 2022). This algae bloom resulted in individual deaths of the southern distinct population segment of Green Sturgeon, which spawns in the Sacramento River and rears in the Delta, and White Sturgeon which is a state species of special concern. Individuals in both species experienced high rates of mortality in 2022 following this algae bloom.

During the algae bloom event, the San Francisco Bay became a reddish-brown color (Ocean Protection Council, n.d.). The overgrowth of algae can produce cyanotoxins than can affect the aquatic ecosystem health (Ocean Protection Council, n.d.). In the Delta, one common bloom-forming cyanobacteria is the genus *Microcystis*. Algae blooms can result in lower dissolved oxygen levels which leads to fish mortality (Ocean Protection Council, n.d.). Algae blooms can potentially become much more frequent in the future due to warming waters, decreasing flows from inland waters, and increasing concentrations of nutrients from land-based pollutants (Ocean Protection Council, n.d.). Excess nitrogen dissolved in water may be a contributing factor to harmful algal blooms in the San Francisco Bay that threaten human health and safety. The 2022 algal bloom resulted in the death of thousands of fish including leopard sharks, bat rays, striped bass, and others (Ocean Protection Council, n.d.).

When local planners evaluate projects, it will become increasingly important to evaluate the effects of climate change (which will increase water temperatures and the formation of harmful algal blooms). For example, expansion of a wastewater treatment plant capacity may facilitate new residential or commercial development on green space, thereby exacerbating local carbon emissions and contributing to climate change.

Atmospheric River & Spill Reports

Atmospheric rivers are long and narrow parts of the atmosphere that transport water from the tropics to other parts of the world (NOAA, 2015). When the atmospheric river reaches land, it tends to release water vapor in the form of rainfall or snow (NOAA, 2015). With large amounts of water vapor and strong winds, the atmospheric river's rainfall can result in extreme flooding when stalling over a watershed that is vulnerable to flooding (NOAA, 2015). A key example is the "Pineapple Express," which is a strong atmospheric river that transports moisture from the tropics surrounding Hawaii to the U.S. West Coast (NOAA, 2015). Atmospheric rivers can be beneficial as they can provide necessary rain or snow to an area (NOAA, 2015). The frequency and/or intensity of atmospheric rivers may be exacerbated by climate change.

During December 2022 and January 2023, a series of atmospheric rivers arrived in California and caused heavy rains. This storm water encountered sewer pipes and local wastewater treatment plants and then created sewage spills. Local agencies are required to report sewage spills to the CA Office of Emergency Services. The OES database was queried, and the results of this database query are shown in Table A6-6 below. These results show that between 07/26/2022 and 01/14/2023 there were 48 spill reports listed in the database.

Table F-1
CA Office of Emergency Services
Spill Report

Control # Document Title	Creation Date	City	Agency	Spill Site	Water Type
Spill Report	01/14/2023 at 09:25 AM	Bethel Island	Private Citizen	Residence	Sewage
Spill Report	01/11/2023 at 06:33 PM	Richmond	West County Wastewater	Treatment/ Sewage	Sewage
Cal OES-Update	01/12/2023 at 04:53 PM				Sewage
Cal OES-	01/13/2023				Sewage
CAL OES-Update	01/15/2023 at 05:56 PM				Sewage
Spill Report	01/10/2023 at 03:23 PM	Crockett	Crocket Community	Other	Sewage
Spill Report	01/09/2023 at 08:07 AM	Richmond	City of Richmond	Merchant/ Business	Sewage
Spill Report	01/09/2023 at 08:05 AM	Richmond	City of Richmond	Residence	Sewage
Spill Report	01/09/2023 at 08:03 AM	Richmond	City of Richmond	Residence	Sewage
Spill Report	01/09/2023 at 08:01 AM	Richmond	City of Richmond	Residence	Sewage
Spill Report	01/09/2023 at 07:59 AM	Richmond	City of Richmond	Residence	Sewage
Spill Report	01/09/2023	Richmond	City of Richmond	Merchant/ Business	Sewage
Spill Report	01/04/2023 at 10:46 PM	Martinez	Martinez Refining Company	Refinery	Sewage
Spill Report	12/31/2022 at 08:49 PM	Antioch	Delta Diablo	Utilities/ Substation	Sewage
Spill Report	12/31/2022 at 08:46 PM	Antioch	Delta Diablo	Utilities/ Substation	Sewage
Spill Report	12/31/2022 at 04:18 PM	Antioch	Delta Diablo	Treatment/ Sewage	Sewage
Cal OES-Update	12/31/2022 at 08:52 PM				Sewage
Spill Report	12/31/2022 at 04:18 PM	Pittsburg	Delta Diablo	Treatment/ Sewage	Sewage
Spill Report	12/31/2022 at 04:18 PM	Bay Point	Delta Diablo	Treatment/ Sewage	Sewage
Spill Report	12/31/2022 at 02:28 PM	Pittsburg	City of Pittsburg	Road	Sewage
Spill Report	12/31/2022 at 01:53 PM	Martinez	Mountview Sanitary	Waterways	Sewage
Spill Report	12/31/2022 at 01:52 PM	Martinez	Mountview Sanitary District	Treatment/Sewage	Sewage
Spill Report	12/31/2022 at 12:46 PM	Richmond	City of Richmond	Road	Sewage
Spill Report	12/31/2022 at 12:39 PM	Richmond	City of Richmond	Road	Sewage
Spill Report	12/31/2022 at 12:39 PM	Richmond	City of Richmond	Road	Sewage

Spill Report	12/31/2022 at 12:39 PM	Richmond	City of Richmond	Road	Sewage
Spill Report	12/31/2022 at 12:39 PM	Richmond	City of Richmond	Road	Sewage
Spill Report	12/31/2022 at 12:39 PM	Richmond	City of Richmond	Road	Sewage
Spill Report	12/31/2022 at 12:09 PM	Bethel Island	Ironhouse Sanitary District	Road	Sewage
Spill Report	12/31/2022 at 10:33 AM	Richmond	City of Richmond	Road	Sewage
Spill Report	12/29/2022 at 02:31 PM	Crockett	Crockett Community	Residence	Sewage
Spill Report	12/28/2022 at 03:59 PM	Richmond	City of Richmond	Refinery	Sewage
Spill Report	12/19/2022 at 01:58 PM	Crockett	Crockett Comm Services	Residence	Sewage
Spill Report	12/11/2022 at 02:13 PM	Brentwood	City of Brentwood	Residence	Sewage
Spill Report	12/14/2022	Richmond	West County Waste	Refinery	Sewage
Spill Report	12/11/2022 at 02:13 PM	Brentwood	City of Brentwood	Residence	Sewage
Spill Report	11/20/2022 at 02:09 PM	Rodeo	Private Citizen	Residence	Sewage
Spill Report	11/14/2022 at 11:20 PM	San Pablo	West Co Wastewater	Utilities/Substation	Sewage
Spill Report	10/21/2022 at 09:55 AM	Clayton	City of Concord	Residence	Sewage
Cal OES-Update	10/21/2022 at 03:22 PM				Sewage
Spill Report	10/03/2022 at 02:42 PM	Walnut Creek	Private Citizen	Waterway	Sewage
Spill Report	09/30/2022 at 02:03 AM	Crockett	Crocket CSD	Residence	Sewage
Spill Report	09/26/2022 at 12:05 PM	Concord	City of Concord	Road	Sewage
Spill Report	09/14/2022	Discovery Bay	Veolia	Waterways	Sewage
Spill Report	09/14/2022	Discovery Bay	Private Citizen	Waterways	Sewage
Spill Report	09/06/2022 at 02:09 PM	San Ramon	SanRamonResident	Waterways	Sewage
Spill Report	09/05/2022 at 10:31 AM	Concord	City of Concord	Waterways	Sewage
Cal OES-Update	09/06/2022 at 08:55 AM				Sewage
Spill Report	08/29/2022 at 06:47 AM	Richmond	Chevron Products	Refinery	Sewage
Cal OES-Update	08/29/2022 at 07:12 AM				Sewage
Spill Report	08/27/2022 at 05:02 PM	Walnut Creek	Central Contra Costa	Road	Sewage
Cal OES-Update	08/30/2022 at 09:15 AM				Sewage
Spill Report	08/22/2022 at 01:21 PM	San Pablo	West County Waste	Road, Waterways	Sewage
Spill Report	08/20/2022 at 03:17 PM	Richmond	Private Citizen	Waterways	Unspecified
Spill Report	08/18/2022	San Pablo	West County Waste	Utilities/	Sewage

				Substation	
Spill Report	08/10/2022 at 01:22 PM	Concord	City of Concord	Other	Sewage
Cal OES-Update Spill	07/26/2022	Antioch	City of Antioch	Road	Sewage

Data Source:
https://w3.calema.ca.gov/operational/malhaz.nsf/f1841a103c102734882563e200760c4a?SearchView
search results for "Contra Costa"

Water Quality

Water quality is heavily regulated in the San Francisco Bay Area as described in detail in Appendix X. In addition to the previously described excess nutrient concern, there are some emerging concerns about potential water pollutants that may be at risk of passing through water treatment plants and into discharge points. There has been growing concern that bays, deltas, and oceans are seeing elevated levels of water pollution including:

- Micro-plastics, and
- per-and polyfluoroalkyl substances (PFAS),

The Regional Water Quality Control Board and their partners are researching and monitoring these pollutants. Due to a lack of information, these potential pollutants are not described in any detail in this MSR. However, a brief introduction to these pollutants is provided herein because LAFCO's next MSR on wastewater service providers may need to address these items.

Microplastics are a diverse class of persistent contaminants that have been observed in water, sediment, and wildlife worldwide. Microplastics and other microparticles have been characterized in San Francisco Bay to determine abundance, sources, pathways, and loadings of these contaminants in a densely populated urban environment. Microplastics can be found in stormwater runoff, wastewater effluent, open bay and sanctuary surface waters, bay sediment, as well as two species of prey fish and bivalves. Studies have been conducted in the Bay to validate a process-based particle transport model for the Bay and Sanctuaries that can be used to predict the transport and fate of microplastics in the region. Microplastics may enter the wastewater treatment system from residential washing machines that wash polyester clothes or from industrial customers. Additionally, sanitary sewer overflows are a probable source of microplastics (Coffin, 2022; Sutton, 2016; Sutton, 2020;). However, under normal circumstances, the contributions of wastewater effluent to microplastic pollution is probably relatively small as stormwater is a larger contributor.

PFAS are commonly called 'forever chemicals.' PFAS are a category of chemicals used since the 1940s to repel oil and water and resist heat, which makes them useful in everyday products such as nonstick cookware, stain resistant clothing, and firefighting foam. The science is clear that exposure to certain PFAS over a long period of time can cause cancer and other illnesses. In addition, PFAS exposure during critical life stages such as pregnancy or early childhood can also result in adverse health impacts. Exposure to PFAS has been linked to

deadly cancers, impacts to the liver and heart, and immune and developmental damage to infants and children. For example, manufacturing facilities may sometimes discharge PFAS[2] into the wastewater treatment system.

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[2] For more information on PFAS, please note the following informational resources. PFAS is a general term that encompasses several different chemical varieties including PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA (also known as "GenX Chemicals")., and "GenX chemicals. PFAS can often be found together in mixtures, and research shows these mixtures may have combined health impacts. The Environmental Working Group provides an online map of PFAS contamination at: <*https://www.ewg.org/interactive-maps/pfas_contamination/map/*>. Poly- and Perfluoroalkyl Substances in Municipal Wastewater Treatment Plants in the United States: Seasonal Patterns and Meta-Analysis of Long-Term Trends and Average Concentrations are described at: <*https://pubs.acs.org/doi/10.1021/acsestwater.1c00377*>. PFAS Treatment in drinking water and wastewater is described in the State of the Science Report at: <*https://www.epa.gov/research-states/pfas-treatment-drinking-water-and-wastewater-state-science*>. A report called "PFAS in the Water and Wastewater Sectors: Fundamentals, Management, and Treatment" is available online at: <*https://www.wef.org/publications/publications/books/pfas-in-the-water-and-wastewater-sectors-fundamentals-management-and-treatment/*>.

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Appendix G

Wastewater Regulations

Appendix G: Wastewater Regulations

Table of Contents

REGULATIONS FOR WASTEWATER SYSTEMS

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

Federal Wastewater Treatment Regulations

Clean Water Act

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

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

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

National Pollutant Discharge Elimination System (NPDES)

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

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

For example, high mercury levels can make regular consumption of fish unsafe. Urban stormwater runoff is one of the largest sources of pollution in the USA.

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

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

Section 303(d) Impaired Waters List and TMDLs

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

National Toxics Rule

The EPA established the National Toxics Rules (NTR) to create numeric criteria for priority toxic pollutants for California and 13 other states and territories that were not in complete compliance with the CWA. For California, the NTR established water quality standards for protection of

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

aquatic life and/or human health for 36 pollutants for which water quality criteria exist, but which were not covered under California's statewide water quality regulations.

California Toxics Rule

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

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

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

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

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

EPA contends that since California is implementing EPA's current regulations, the CTR will not impose any incremental costs and that the water quality criterion does not directly create

economic impacts. EPA staff notes that California has some discretion to develop mechanisms that could result in more flexibility for local areas (e.g., site-specific criteria, phased TMDL program).

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

California Wastewater Treatment Regulations

CA Water Code

The California Water Code is the principal state regulation governing the use of water resources within the State of California. This law controls, among other issues, water quality protection and management and management of water-oriented agencies. Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Act, is the principal mechanism for the regulation of water quality and pollution issues within California. This act established a regulatory program to protect the water quality and beneficial uses of all state waters. The Porter-Cologne Act also established the State Water Resources Control Board and California Regional Water Quality Control Boards (RWQCB) as principal state agencies responsible for water quality control. The SWRCB has divided California into nine regions, with Contra Costa County located in the San Francisco Bay RWQCB, Region 2.

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

The San Francisco Bay RWQCB, as with all other regional boards, must formulate and adopt a water quality plan for its region, which must conform to the Porter-Cologne Act. The Porter-Cologne Act also provides that a regional office, such as the San Francisco Bay RWQCB, may include within its regional plan water discharge prohibitions applicable to local conditions, areas,

and types of waste. The regional offices are also authorized to enforce discharge limitations, take actions to prevent violations, and conduct investigations about the quality of any of the waters of the State. Civil and criminal penalties are applicable to persons who violate the requirements of the Porter-Cologne Act or SWRCB/RWQCB orders.

The Porter-Cologne Act also requires dischargers of fill and dredged material to all waters of the State be regulated. Additional protections are provided for wetlands, special aquatic sites, and headwaters because these waterbodies have high resource value, are vulnerable to filling, and are not protected by other programs. The San Francisco Bay RWQCB CWA Section 401 program is involved with the protection of special-status species and the regulation of hydromodification impacts. The RWQCB encourages watershed-level analysis and protection because some functions of wetlands, riparian areas, and headwater streams–including pollutant removal, flood water retention, and habitat connectivity–are expressed at the watershed or landscape level.

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

Assembly Bill 885

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

In 2018, the SWRCB adopted Resolution No. 2018–0019, which amends the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS). This resolution amends resolution 2012–0032, adopted in 2012, authorizes subsurface disposal of domestic wastewater, and establishes minimum requirements for the permitting, monitoring, and operation of OWTS for protecting beneficial uses of waters of the State. Contra Costa County Environmental Health is the local permitting authority that ensures compliance with all applicable State and local regulatory requirements for the installation and repair of OWTS.

Statewide General Waste Discharge Requirements

A consistent, statewide regulatory approach to address sanitary sewer overflows (SSOs) is provided by the SWRCB's adopted Statewide General Waste Discharge Requirements (WDRs) for Sanitary Sewer Systems (SSS), Water Quality Order No. 2022-0103-DWQ (Sanitary Sewer Systems WDR) in 2022. The Sanitary Sewer Systems WDR requires public agencies that own or operate sanitary sewer systems to develop and implement Sewer System Management Plans and report all SSOs to the State Water Board's online SSO database. The SSO database was queried for each wastewater service provider studied in this MSR. Most Contra Costa area wastewater service providers have completed their Sewer System Management Plans as described in this MSR.

California Storm Drainage & Flood Control Regulations

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

Local Wastewater Regulations

Contra Costa County has policies and procedures consistent with the San Francisco Bay RWQCB recommendation for connection to a public wastewater system in urbanized areas.

Septic System Permitting

Septic systems are also referred to as on-site wastewater treatment systems (OWTSs). OWTS are regulated by the Contra Costa County Municipal Code, Chapter 420-6, Sewage Collection and Disposal. Improperly designed or poorly constructed or maintained OWTSs can contaminate groundwater. The Environmental Health Program reviews OWTS design plans and inspects the construction of OWTSs to prevent threats to groundwater and public health. The permits are intended to enforce applicable septic system siting, sizing, and design guidelines to protect water quality and comply with Basin Plan provisions. Environmental Health Program staff investigate complaints of improperly functioning OWTSs, and review applications for building permits on lots served by OWTSs.

Contra Costa County General Plan

The County General Plan Growth Management Element, under the subheading "Sanitary Sewer," states the following (Contra Costa County 2005b): The County, pursuant to its police power and as the proper governmental entity responsible for directly regulating land use density or intensity, property development and the subdivision of property within the unincorporated areas of the County, shall require new development to demonstrate that adequate sanitary sewer

quantity and quality can be provided. At the project approval stage, (subdivision map, land use permit, etc.), the County may consult with the appropriate sewer agency. The County, based on information furnished or available from consultations with the appropriate sewer agency, the proponent, or other sources, should determine whether (1) capacity exists within the sewer system if the development project is built within a set period of time, or (2) capacity will be provided by a funded program or other mechanism. Project approvals conditioned on (1) or (2) above, will lapse according to their terms if not satisfied by verification that capacity exists to serve the specific project ("will serve letters"), actual hook-ups or comparable evidence of adequate sewage collection and wastewater treatment capacity availability.

The County's General Plan also establishes goals and policies for public services. The General Plan contains the following policies in Chapter 7, Public Facilities/Services Element that apply to wastewater (Contra Costa County 2005a):

Policy 7-29 Sewer treatment facilities shall be required to operate in compliance with waste discharge requirements established by the California Regional Water Quality Control Board. Development that would result in the violation of waste discharge requirements shall not be approved.

Policy 7-30 Sewer service agencies shall be encouraged to establish service boundaries and develop treatment facilities to meet future service needs based on the growth policies contained in the County and cities' General Plans.

Policy 7-31 Expansion into new areas within the Urban Limit Line but beyond the Spheres of Influence should be restricted to those areas where urban development can meet growth management standards included in this General Plan.

Policy 7-32 Development of rural residences, or other uses, that will be served by septic tank and leachfields, shall be discouraged in areas with high groundwater levels or soils with poor percolation characteristics.

Policy 7-33 At the project approval stage, the County shall require new development to demonstrate that wastewater treatment capacity can be provided. The County shall determine whether (1) capacity exists within the wastewater treatment system if a development project is built within a set period of time, or (2) capacity will be provided by a funded program or other mechanism. This finding will be

based on information furnished or made available to the County from consultations with the appropriate water agency, the applicant, or other sources.

Policy 7-37 The need for sewer system improvements shall be reduced by requiring new development to incorporate water conservation measures which reduce flows into the sanitary sewer system.

Contra Costa County Sewage Ordinance

Title 4, Division 420, of the County Municipal Code addresses sewage and collection. The Municipal Code identifies requirements for the installation of sewer lines and the construction of sewage processing plants. Construction of wastewater facilities is subject to review and approval of the Director of Public Works and the County Health Officer.

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

Wastewater Solids Regulations

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

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

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

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

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

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

Future Regulatory Considerations

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

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

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

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

Nationwide Nutrient Criteria

In November 2007, the National Resources Defense Council (NRDC) filed a petition with the EPA to require that nutrient removal be included in the definition of secondary treatment. The petition stated that "there are many [biological processes] which can achieve total phosphorus levels of

1.0 milligrams per liter (mg/L) as a monthly average, and a total nitrogen of 6 to 8 mg/L as an annual average" (NRDC et al, 2007).

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

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

State of California Nutrient Numeric Endpoints

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

Microconstituents and Bioaccumulative Constituents

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

- Persistent organic pollutants (POPs) such as polybrominated diphenyl ethers (PBDEs; used in flame retardants, furniture foam, plastics, etc.) and other organic contaminants.

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

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

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

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

Biostimulatory Substances Objective and Implementation of Biological Integrity

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

The State Water Resources Control Board (State Water Board) is proposing to adopt a statewide water quality objective for biostimulatory substances along with a program of implementation as an amendment (Biostimulatory Substances Amendment or project) to the Water Quality Control

Plan for Inland Surface Water, Enclosed Bays and Estuaries of California (ISWEBE Plan). The Biostimulatory Substances Amendment could include a statewide numeric objective or a statewide narrative objective (with a numeric translator) and various regulatory control options for point and non-point sources.

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

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

California State Recycled Water Policy

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

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

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List of Appendix H

Methane Emissions

Appendix H
Methane Emissions from Wastewater Collection and Treatment

Municipal wastewater collection and treatment systems, such as those studied in this MSR, have been found to emit methane gas. Methane is an odorless gas that is composed of carbon and hydrogen (Britannica, 2018). Methane is considered a greenhouse gas that contributes to climate change, since anthropogenic methane production can cause concentrations to increase more quickly than can be offset by sinks (Britannica, 2018).

Professors Daniel Moore and Cuihong Song from the Department of Civil and Environmental Engineering at Princeton University published two studies in 2023 in the journal Environmental Science & Technology on this important issue.

- The first study performed on-the-ground methane emissions measurements at 63 wastewater treatment plants in the United States (Moore et al., 2023).
- The second study used machine learning methods to analyze published literature data from methane monitoring studies of various wastewater collection and treatment processes around the globe (Song et al., 2023).

These studies found that municipal wastewater treatment plants emit nearly double the amount of methane into the atmosphere than scientists previously believed, according to new research from Princeton University (Moore et al., 2023 & Song et al., 2023). Waste and wastewater are large contributors to airborne methane. As our local cities urbanize the waste collects. However, cities and special districts are also investing in climate-friendly net-zero plans and these plans can help address methane from the liquid wastewater treatment sector.

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Appendix I

Recycled Water

Appendix I

Recycled Water

Introduction to Recycled Water

Due to on-going droughts and aridification, water resource managers and planners across California, are encouraging water reclamation, recycling, and reuse.

What is Recycled Water?

Recycled water is mainly municipal sewage that gets treated in a wastewater facility and then complies with the recycled water regulations for a beneficial use (State Water Resources Control Board, n.d.). Recycled water is utilized to supplement scarce resources and to provide alternatives to effluent disposal into surface waters. Recycled water is now considered an important water resource which helps communities cope with periods of severe drought and a growing demand for water supply due to increasing population[1]. Water reuse (both non-potable and potable) can enable communities to maximize and extend the use of limited freshwater resources.

How is Water Recycled?

Sewage treatment plants now have advanced processes that can treat water to tertiary conditions and allow recycled water to be produced. Disinfected secondary-2.2 recycled water undergoes oxidation and disinfection so the median concentration of the total coliform bacteria in the processed effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters, within the last seven days of analyses (State Water Resources Control Board, 2018). Disinfected secondary-23 recycled water undergoes oxidation and disinfection so the median concentration of the total coliform bacteria in the processed effluent does not exceed a MPN of 23 per 100 milliliters, within the last seven days of analyses (State Water Resources Control Board, 2018). Disinfected tertiary recycled water goes through either a chlorine disinfection or a disinfection process that combines with a filtration process to remove 99.999 percent of plaque units of bacteria (State Water Resources Control Board, 2018). Disinfected tertiary water's measured concentration of total coliform bacteria does not exceed a MPN of 2.2 per 100 milliliters, within the last seven days of analyses (State Water Resources Control Board, 2018).

[1] For example, in the Central Coast of California the City of Morro Bay has initiated a new program called "Our Water". The program strives to build water and wastewater infrastructure to support a sustainable environment, economy, and community (Morro Bay, n.d.). The recently developed Morro Bay Water Reclamation Facility is part of the "Our Water" program and involves the replacement of the existing wastewater treatment plant with an advanced treatment facility (Morro Bay, n.d.). The program seeks to provide a drought buffer and provide up to 80 percent of the City's water needs in the future (Morro Bay, n.d.).

What are the Rules for Recycled Water?

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

Recycled water can be safely used for irrigation, industrial applications, groundwater recharge, and some commercial activities. California has regulations and guidelines that allows wastewater effluent, treated at secondary levels, to be used for irrigation of restricted-access golf courses, cemeteries, freeway landscaping, and nurseries. When wastewater effluent is treated to a tertiary level, it is allowed to be utilized on food crops, school yards, parks, playgrounds, and golf courses (State Water Resources Control Board, 2018).

How is Recycled Water Used Locally?

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

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Appendix J

Wastewater Recommendations from American Society of Civil Engineers

Appendix J: Wastewater Recommendations from American Society of Civil Engineers

Introduction

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

Wastewater: Recommendations To Raise The Grade

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

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