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Appendix 2-1 NOP/NOP Comments

Appendices

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NATIVE AMERICAN HERITAGE COMMISSION

September 25, 2023

Will Nelson
Contra Costa County
30 Muir Road
Martinez, CA 945533

Re: 2023090467, Contra Costa County 2045 General Plan and Climate Action Plan Updates Project, Contra Costa County

Dear Mr. Nelzon:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (https://ohp.parks.ca.gov/?page_id=30331) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, § 15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Cody.Campagne@nahc.ca.gov.

Sincerely,

Cody Campagne

Cody Campagne
Cultural Resources Analyst

cc: State Clearinghouse

State of California
Native American Heritage Commission
1550 Harbor Blvd., Ste. 100
West Sacramento, CA 95691

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CONTRA COSTA COUNTY
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Dept of Conservation & Development

94553-480130

From: Zachariasen, Judith@DOC
To: Advance Planning
Cc: OLRA@DOC; OPR State Clearinghouse
Subject: Contra Costa County 2045 General Plan and Climate Action Plan Updates NOP - SCH #2023090467
Date: Thursday, September 28, 2023 3:58:25 PM
Attachments: image001.png

Dear Will Nelson,

The California Geological Survey (CGS) has received the Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the Contra Costa County 2045 General Plan Update. This email conveys the following recommendations from CGS concerning geologic issues related to the project area:

1. Liquefaction and Landslide Hazards

Contra Costa County contains earthquake zones of required investigation (ZORI) for liquefaction and landslides mapped by CGS. CGS has published Earthquake Zones of Required Investigation Maps (EZRIM) for liquefaction and landsliding covering the Clayton, Honker Bay, Antioch North, Antioch South, Jersey Island, Brentwood, Bouldin Island, Woodward Island, and Clifton Court Forebay quadrangles within Contra Costa County. In addition, CGS has recently released preliminary EZRIM for the Mare Island, San Quentin, Vine Hill, Walnut Creek, Richmond, and Diablo quadrangles. These are currently available for public review, and official EZRIM for these quadrangles are expected to be released in February 2024. EZRIM for the Benicia, Briones, Valley, Las Trampas Ridge quadrangles are in development and planned for preliminary release in spring 2024. The DEIR and supporting documents should address liquefaction and landslide hazards as they relate to planned development.
The combined extent of the published EZRIM can be viewed here:
https://maps.conservation.ca.gov/cgs/EQZApp/app/
Individual Seismic Hazard Zone Reports, EZRIM, and associated GIS data are available for download here:
https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps
The County should already have been provided access to the preliminary EZRIM currently under review.

CGS suggests the zones of required investigation for liquefaction and landsliding be shown and discussed in the DEIR.

2. Surface Fault Rupture Hazard

Contra Costa County contains earthquake zones of required investigation (ZORI) for surface fault rupture (Earthquake Fault Zones [EFZ]) associated with the Hayward, Calaveras, Concord, and Greenville faults. The DEIR and supporting documents should address this hazard as it relates to planned development. Additional information is available at the links below:
https://maps.conservation.ca.gov/cgs/EQZApp/app/
https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps

CGS suggests the zones of required investigation for surface fault rupture be shown and discussed in the DEIR.

3. Ground Shaking Hazards

As noted above, the planning area contains EFZs mapped by CGS. In addition, numerous

other active faults are located nearby. The county, therefore, could be subject to significant ground shaking. The DEIR and supporting documents should address this hazard as it relates to planned development. Additional information about ground shaking hazard can be obtained at the following sites:
https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=14d2f75c7c4f4619936dac0d14e1e468
https://earthquake.usgs.gov/scenarios/catalog/bssc2014/

4. Tsunami Hazards

The CGS has mapped a Tsunami Hazard Area (THA) within the planning area. The purpose of a THA is to assist cities and counties in identifying their exposure to tsunami hazards. It is intended for local jurisdictional, coastal evacuation planning uses only. Additional information can be found at the links below:
https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps
https://www.conservation.ca.gov/cgs/tsunami/maps/contra-costa
https://www.conservation.ca.gov/cgs/Documents/Publications/Tsunami-Maps/Tsunami_Hazard_Area_Map_Contra_Costa_County_a11y.pdf

The County should also discuss that some areas may be within a Tsunami Design Zone determined by the California Building Code (CBC). The CBC requires certain design standards for essential/critical or larger structures. The following website provides additional information regarding Tsunami Design Zones: https://asce7tsunami.online/.

If you have any additional comments or questions, please feel free to call or email.

Thank you,
Judy Zachariasen

Judith Zachariasen, PhD, PG, CEG
Senior Engineering Geologist
Fault Zoning Unit Supervisor
Seismic Hazards Program
California Geological Survey

California Department of Conservation
715 P Street, MS 1900, Sacramento, CA 95814
T: (916) 879-2844
E: judith.zachariasen@conservation.ca.gov

From:	Tim Chan
To:	Advance Planning
Cc:	Val Menotti; Kamala Parks; Rachel Factor
Subject:	NOP for the Contra Costa County 2045 General Plan & Climate Action Plan Environmental Impact Report
Date:	Monday, October 16, 2023 10:17:32 AM
Attachments:	20231016 CCC EIR NOP_BART Letter.pdf

Hi Will, attached, please find our comments on the NOP for the Contra Costa County 2045 General Plan & Climate Action Plan Environmental Impact Report. Thank you.

Office: M-W
Remote: Th-F

Tim Chan
Group Manager - Station Area Planning
2150 Webster St., 8th Floor
Oakland, CA 94612
(C) 510.406.8985

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
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2023

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October 16, 2023

Will Nelson, Principal Planner
Contra Costa County
Department of Conservation and Development
30 Muir Road
Martinez, CA 94553
Sent by email to AdvancePlanning@dcd.cccounty.us

RE: Notice of Preparation for the Contra Costa County 2045 General Plan and Climate Action Plan Environmental Impact Report

Greetings, Will

Thank you for providing the notice of preparation to BART of the County's upcoming EIR effort. We always appreciate the opportunity to collaborate with our local partners and to provide input on each other's efforts.

We would like to remind County staff that BART published its Transit-Oriented Development (TOD) Guidelines in May 2017. It provides valuable input as you consider land under your jurisdiction within the half-mile radius of BART stations. In particular, Table 1 and Figure 1 in the TOD Guidelines indicate zoning and parking that is most appropriate for land closest to regionally significant transit stations. Enabling developments that provide high concentrations of residential, commercial, and/or social activities in this half-mile radius will not only help improve ridership for BART but will aid the County's efforts to reduce vehicle miles traveled and greenhouse gas emissions.

Additionally, we encourage staff to ensure that these updates align with the Metropolitan Transportation Commission's Transit-Oriented Communities Policy. Doing so will better position the County for discretionary funding opportunities as they become available.

If you have any questions, you may contact BART's station planners for Contra Costa County: Kamala Parks at kparks2@bart.gov or Rachel Factor at rfactor@bart.gov.

Sincerely,

Tim Chan
Station Area Planning Group Manager

Cc: Val Menotti, Chief Planning and Development Officer
Rachel Factor, BART, Principal Planner
Kamala Parks, BART, Principal Planner

From:	McGowan, Timothy
To:	Advance Planning
Subject:	Notice of Preparation (NOP) for the Contra Costa County 2045 General Plan and Climate Action Plan
Date:	Monday, October 16, 2023 3:30:57 PM
Attachments:	wdpd23_227 Contra Costa County 2045 General Plan and Climate Action Plan.pdf

Please find EBMUD comment letter the Notice of Preparation (NOP) for the Contra Costa County 2045 General Plan and Climate Action Plan attached to this email.

EAST BAY
MUNICIPAL UTILITY DISTRICT

October 16, 2023

Will Nelson, Principal Planner
Contra Costa County
Department of Conservation and Development
30 Muir Road
Martinez, CA 94553

Re: Notice of Preparation for the Contra Costa County 2045 General Plan and Climate Action Plan Environment Impact Report and Notice of Public Scoping Meeting

Dear Mr. Nelson:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Contra Costa County 2045 General Plan and Climate Action Plan located in the Contra Costa County (County). EBMUD has the following comments.

WATER SERVICE

Effective January 1, 2018, water service for new multiunit structures shall be individually metered or sub-metered in compliance with Section 537 of California's Water Code & Section 1954.201-219 of California's Civil Code, which encourages conservation of water in multifamily residential and mixed-use multi-family and commercial buildings by requiring metering infrastructure for each dwelling unit, including appropriate water billing safeguards for both tenants and landlords. EBMUD water services shall be conditioned for all development projects within the General Plan area that are subject to these metering requirements and will be released only after the project sponsor has satisfied all requirements and provided evidence of conformance with Section 537 of California's Water Code & Section 1954.201-2019 of California's Civil Code.

Main extensions that may be required to serve any specific developments within the General Plan area to provide adequate domestic water supply, fire flows, and system redundancy will be at the project sponsor's expense. Please see the attached EBMUD documents for California (Waterworks Standards) Code of Regulations, Title 22, Section 64572 (Water Main Separation) and EBMUD requirements for placement of water mains (Attachment 1). Pipeline and fire hydrant relocations and replacements due to modifications of existing streets, and off-site pipeline improvements, also at the project sponsor's expense, may be required depending on EBMUD metering requirements and fire flow requirements set by the local fire department. When the development plans are finalized for individual projects within the General Plan, project sponsors for individual projects should contact EBMUD's New Business Office and request a water service

estimate to determine costs and conditions of providing water service to the development. Engineering and installation of new and relocated pipelines and services require substantial lead time, which should be provided for in the project sponsor's development schedule.

EBMUD's Standard Site Assessment Report indicate the potential for contaminated soils or groundwater to be present within development projects within the General Plan area. The project sponsor should be aware that EBMUD will not install piping or services in contaminated soil or groundwater (if groundwater is present at any time during the year at the depth piping is to be installed) that must be handled as a hazardous waste or that may be hazardous to the health and safety of construction and maintenance personnel wearing Level D personal protective equipment. Nor will EBMUD install piping or services in areas where groundwater contaminant concentrations exceed specified limits for discharge to the sanitary sewer system and sewage treatment plants. The project sponsor must submit copies to EBMUD of all known information regarding soil and groundwater quality within or adjacent to the project boundary and a legally sufficient, complete and specific written remediation plan establishing the methodology, planning and design of all necessary systems for the removal, treatment, and disposal of contaminated soil and groundwater.

EBMUD will not design piping or services until soil and groundwater quality data and remediation plans have been received and reviewed and will not start underground work until remediation has been carried out and documentation of the effectiveness of the remediation has been received and reviewed. If no soil or groundwater quality data exists, or the information supplied by the project sponsor is insufficient, EBMUD may require the project sponsor to perform sampling and analysis to characterize the soil and groundwater that may be encountered during excavation, or EBMUD may perform such sampling and analysis at the project sponsor's expense. If evidence of contamination is discovered during EBMUD work on the project site, work may be suspended until such contamination is adequately characterized and remediated to EBMUD standards.

MOKELUMNE AQUEDUCTS

EBMUD's Mokelumne Aqueducts (Aqueduct) right-of-way (owned in fee) is located within portions of the County (see Attachment 2 - Map of EBMUD Aqueducts within Contra Costa County). Any projects being planned within or immediately adjacent to EBMUD property will need to follow EBMUD's Procedure 718 – Raw Water Aqueduct Right-of-Way Non-Aqueduct Uses. A copy of the procedure is attached for your reference (see Attachment 3).

Design drawings for any project encroachment (roadway, utility, facility, etc.) or restoration projects crossing or within the Aqueduct right-of-way will need to be submitted to EBMUD for review of possible drainage, site grading, fencing, construction access, and other conditions that may impact EBMUD property. EBMUD requires a full set of drawings (full size or 11" x 17") as well as an electronic copy in PDF format. All submittals shall be sent to the attention of Vincent H. Pon, P.E., Superintendent of

Aqueduct Section, 1804 West Main Street, Stockton, CA 95203. Additional information and an encroachment package are included in EBMUD's Procedure 718. Applications for non-EBMUD uses will not be processed unless accompanied by the appropriate application fees outlined in the current applicable Water and Wastewater System Schedule of Rates and Charges and Fees. Contractors must secure an encroachment permit from EBMUD Aqueduct Section prior to mobilizing and starting construction work. A pre-construction meeting with EBMUD is mandatory.

When a project involves the construction of a retaining wall and fence along EBMUD property line; these must be constructed completely outside of EBMUD property, including all footings. The project sponsor shall contact EBMUD's Survey Section to coordinate identifying, locating and marking correct property lines.

WATER RECYCLING

EBMUD's Policy 9.05 requires that customers use non-potable water, including recycled water, for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant, fish and wildlife to offset demand on EBMUD's limited potable water supply.

The County's boundaries include the City of San Ramon and Town of Danville that fall within and around the service area of the Dublin San Ramon Services District - EBMUD Recycled Water Authority (DERWA) and EBMUD's San Ramon Valley's Recycled Water Project transmission and distribution pipeline infrastructure. New projects and developments present several opportunities for recycled water uses ranging from landscape irrigation, toilet flushing, cooling, and other non-potable commercial and industrial applications that can be served by existing or expanded recycled water pipelines in the future. In 2019, DERWA and the participating agencies implemented a moratorium on new recycled water connections in San Ramon and Danville pending securing additional wastewater sources that can be utilized to expand the treatment and service of recycled water within the San Ramon Valley Region. Therefore, as EBMUD advances plans and implements its recycled water supply expansion in that region, EBMUD requests the County and their developers coordinate closely with EBMUD and consider potential recycled water uses during the planning of the various General Plan components to further explore the options and requirements relating to recycled water use. Accordingly, EBMUD will assess and consider the feasibility of providing recycled water to specific project areas for appropriate uses.

WATER CONSERVATION

Individual projects within the General Plan area presents an opportunity to incorporate water conservation measures. EBMUD requests that the County include in its conditions of approval a requirement that the project sponsor comply with Assembly Bill 325, "Model Water Efficient Landscape Ordinance," (Division 2, Title 23, California Code of

Regulations, Chapter 2.7, Sections 490 through 495). The project sponsor should be aware that Section 31 of EBMUD's Water Service Regulations requires that water service shall not be furnished for new or expanded service unless all the applicable water-efficiency measures described in the regulation are installed at the project sponsor's expense.
If you have any questions concerning this response, please contact Timothy R. McGowan, Senior Civil Engineer, Major Facilities Planning Section at (510) 287-1981.

Sincerely,

David J. Rehnstrom
Manager of Water Distribution Planning

DJR:EZ:djr
wdpd23_227 Contra Costa County 2045 General Plan and Climate Action Plan.doc

Attachments:
1. Applicant Pipeline Design Criteria
2. Map of Mokelumne Aqueducts
3. EBMUD Procedure 718 – Authorized Uses of Pipeline Rights-of-Way

EAST BAY MUNICIPAL UTILITY DISTRICT

Applicant Pipeline Design Criteria

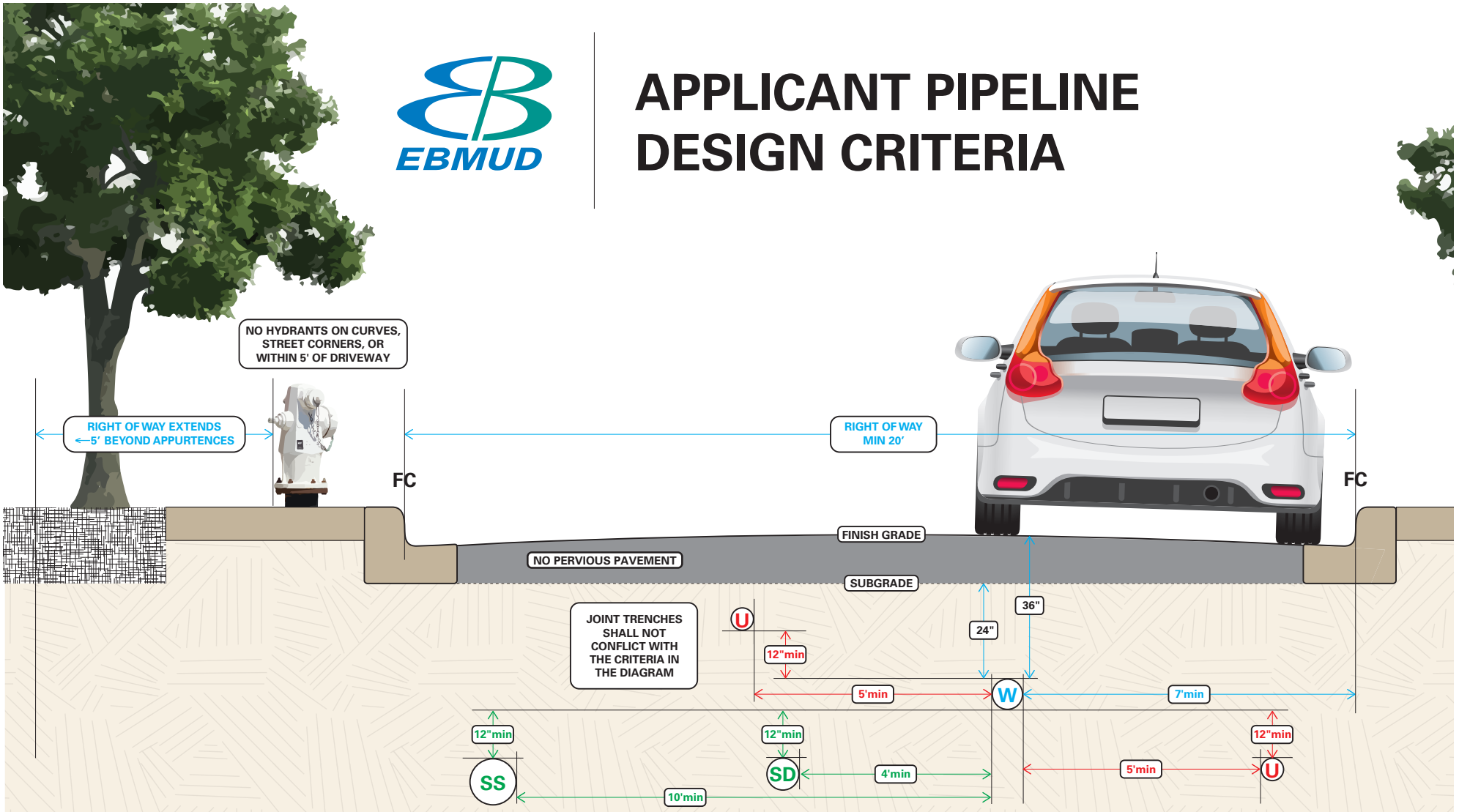
EBMUD values applicant pipeline projects and is committed to providing a thorough and efficient design. To ensure an efficient design process and to avoid significant delays the design criteria below should be adhered to when submitting improvement plans.

Design Criteria

- Water mains shall be seven (7) feet from face of curb.
- Water mains shall maintain a minimum one (1) foot vertical and five (5) foot horizontal clearance from other utilities.
- Gas mains shall meet the one (1) foot vertical separation requirement by installing the gas main below the water main only.
- Water mains shall maintain a minimum ten (10) foot horizontal clearance (O.D. to O.D.) and be located a minimum one (1) foot above any sewer main. Title 22 CCR
- Water mains shall maintain a minimum four (4) feet horizontal clearance (O.D. to O.D.) and be located a minimum one (1) foot above any storm drain. Title 22 CCR
- Water mains shall have a 36-inch cover to final grade and 24-inch cover to pavement subgrade.
- Joint trenches that are in conflict with the criteria above may delay the project. Submit to EBMUD final joint trench plans (no intent plans) which include the size of the joint trench and the utilities located inside.
- Water mains shall not be installed under pervious pavement.
- Water mains installed under decorative pavement, pavers, or stamped concrete will require an additional paving agreement.
- Hydrants shall not be located on curved sections of street, street corners, or within five feet of a driveway.
- Right of ways for 6-inch and 8-inch water mains shall be a minimum of 20 feet wide and extend five (5) feet past the water main centerline.
- Right of ways for 12-inch to 24-inch water mains shall be a minimum of 20 feet wide and extend eight (8) feet past the water main centerline.

Please contact the New Business Office representative assigned to your project if there are any questions regarding the requirements listed above. Meeting this criteria will enable the most efficient design possible.

APPLICANT PIPELINE DESIGN CRITERIA



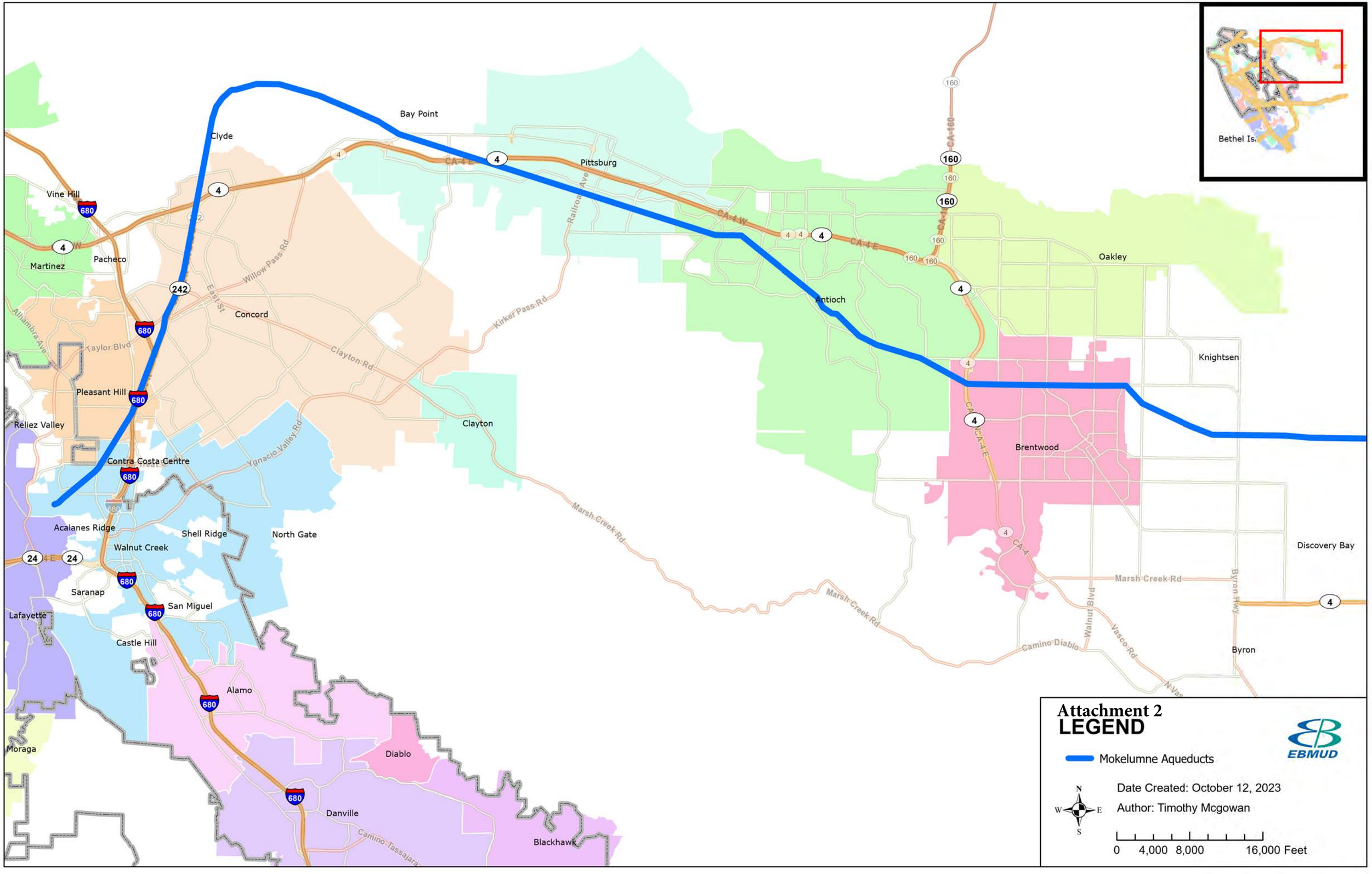
W = WATER
24" cover to subgrade
36" cover to final grade
7' inset from face of curb

U = UTILITY
min 12" vertical clearance
min 5' horizontal clearance

SS = SANITARY SEWER
min 12" below water
min 10' horizontal clearance

SD = STORM DRAIN
min 12" below water
min 4' horizontal clearance

FC= FACE OF CURB


Bethel Is.
Bay Point
Clyde
Pittsburg
Vine Hill
Martinez
Pacheco
Concord
Willow Pass Rd
East St
Kirker Pass Rd
Railroad Ave
Alhambra Ave
Taylor Blvd
Pleasant Hill
Clayton
Clayton Rd
Reliez Valley
Ygnacio Valley Rd
Contra Costa Centre
Acalanes Ridge
Shell Ridge
North Gate
Walnut Creek
Saranap
San Miguel
Lafayette
Castle Hill
Alamo
Moraga
Diablo
Danville
Blackhawk
Camino Tassajara
Antioch
Oakley
Knightsen
Brentwood
Marsh Creek Rd
Discovery Bay
Byron
Byron Hwy
Walnut Blvd
Vasco Rd
Camino Diablo
CA-4 W
CA-4 E
CA-160
Attachment 2
LEGEND
Mokelumne Aqueducts
EBMUD
Date Created: October 12, 2023
Author: Timothy Mcgowan
N
W
E
S
0 4,000 8,000 16,000 Feet

EBMUD

AUTHORIZED USES OF PIPELINE RIGHTS-OF-WAY

EFFECTIVE	08 JUL 20
SUPERSEDES	25 MAY 17
LEAD DEPARTMENT	O&M

PURPOSE – To establish procedures and criteria for review and authorization of overhead, surface, and sub-surface use of District-owned and easement established property containing raw and distribution water aqueducts and pipelines ("pipelines") for purposes other than installation, maintenance, and operation of District pipelines.

Forms Used

L-14	Limited Land Use Permit
K-47	Work Request Agreement
N-15	Certificate of Public Liability Insurance
N-17	Certificate of Workers' Compensation Insurance
	Application for Use of EBMUD Property or Request for Information
	General Fund Receipts for Miscellaneous Payments

Authority and Responsibility

Use, development, and control of fee-owned and easement established rights-of-way for District and non-District uses must be consistent with the District's operations, maintenance, security, and the rights and obligations of the District. District and non-District uses of District-owned pipeline rights-of-way may be permitted, at the District's sole discretion, only if the uses conform to Policy 7.01, Aqueduct and Distribution Pipeline Rights-of-Way Maintenance and the requirements of this Procedure.

- No use of District pipeline rights of way or property by others will be permitted as a condition to meet city/county zoning requirements or to obtain any land use permit, approval, or entitlement affecting properties not owned by the District.
- No use of District properties by others will be permitted except under terms of a written agreement.
- Use of pipeline rights-of-way for District purposes shall have the concurrence of the Director of Operations and Maintenance and shall include all applicable protections required for similar third-party use.
- The Board of Directors has exclusive authority to approve any proposed right-of-way use requiring the adoption and implementation of one or more mitigation measures to minimize potentially significant environmental impacts.
- The decision whether to authorize any party other than the District to use District-owned property containing pipelines for any non-District purpose is a legislative act undertaken at the sole discretion of District staff. No notice or hearing is required to consider an application for use of such property, and staff's decision is not subject to appeal.

Acceptable long-term uses of the pipeline rights-of-way include but are not necessarily limited to: utility crossings, road crossings, limited agriculture, equestrian and pedestrian trails, parks, oil and gas leases, and District-owned ground water wells. Acceptable long-term uses of rights-of-way and easements for future pipelines will be evaluated upon facility completion. Such uses will be authorized in writing. All approved uses will conform to the requirements and limitations described in the attached EBMUD Requirements for Entry or Use of Pipeline Rights-of-Way (Requirements for Entry or Use) and all other conditions as specified in the written approval.

The Water Supply Division and the Water Treatment and Distribution Division are each primarily responsible to implement this Procedure with respect to proposed uses of rights-of-way containing a facility "owned" by that Division. Facility "ownership" for this purpose is determined based on which Division has "Overall Responsibility" for the facility according to Table 1 of Procedure 706 – Facilities: Inspection, Maintenance and Repair. Wherever this Procedure allocates responsibility to both Divisions in the

alternative, the responsibility shall rest with the Division which owns the facility within the right-of-way which is proposed to be used.

The Water Supply or the Water Treatment and Distribution Divisions are responsible for monitoring permitted uses and detecting and preventing unauthorized uses of pipeline rights-of-way, respectively.

The Office of General Counsel and the Manager of Real Estate Services will be consulted when an unauthorized user will not voluntarily desist.

The Water Supply or the Water Treatment and Distribution Divisions are responsible for coordinating the development of recommendations with respect to the terms and conditions to be stipulated when a District or non-District use of a pipeline right-of-way is to be permitted.

The Director of Engineering and Construction shall be consulted as necessary to provide location analysis or to determine what structural, grading, drainage, corrosion protection or other engineering measures are required and to obtain estimates of engineering, design and inspection costs.

Inquiries and Applications for Use

Applications and inquiries for use of pipeline rights-of-way shall be processed by the Water Operations Department. Applications for non-District uses will not be processed unless accompanied by the appropriate application fees specified in the District's "Water and Wastewater System Schedules of Rates and Charges, Capacity Charges, and Other Fees".

The **Water Operations Department** is responsible for:

- Providing requirements for use of the District's pipeline rights-of-way to applicants requesting use of the right-of-way. See the attached Requirements for Entry or Use.
- Providing requirements to applicants for proposed work located adjacent to the District's pipeline rights-of-way which has the potential to impact the District's pipelines (e.g., proposed excavations that may include use of tiebacks that could result in a vertical encroachment and/or excavations that have the potential for ground movements that could damage District pipelines).
- Checking for completeness of any permit (e.g., Encroachment Permit Application) to ensure compliance with the requirements for entry or use of pipeline rights-of-way contained in Requirements for Entry or Use plus any other conditions applicable to the proposed use.
- Collecting engineering, plan review and construction inspection costs and documentation of insurance coverage, if necessary.
- Monitoring existing encroachments and inspection of the construction of new approved encroachments.
- Providing information to the Engineering and Construction Department for technical input regarding additional permit requirements or special restrictions that may be applicable (in addition to those outlined in the Requirements for Entry or Use).
- Assuring proper environmental documentation for proposed uses through consultation with the Water Distribution Planning Division, when appropriate. Policy 7.01, Aqueduct and Distribution Pipeline Rights-of-Way Maintenance, requires the District to ensure that any construction impacts from third-party use of District rights of way are mitigated to the level of "no significant impact."

Real Estate Services is responsible for:

- Advising the Manager of Water Supply or the Manager of Water Treatment and Distribution of any real estate matters which relate to a specific proposed use.
- Collecting application fees and charges, preparing and executing limited land use permits, leases, easements, and all other property-related agreements (except for revocable licenses and temporary entry permits) and recommending fees and charges appropriate to the property use allowed, and for securing payment. See the current applicable Water and Wastewater System Schedule of Rates and Charges and Fees.
- Maintaining records relating to rights-of-way crossings and use, and providing information to the Engineering and Construction Department for the update of District pipeline drawings.

Types of Permit License or Easement

The Manager of Water Supply or Manager or Water Treatment and Distribution shall keep available the forms listing the general requirements set forth in Requirements for Entry or Use for each of the following:

Temporary Entry/Temporary Construction Permit

For temporary access to pipeline rights-of-way such as for surveying, potholing, construction, for temporary access via the District's right-of-way to property adjacent to the right-of-way, and other similar short-term situations.

Revocable License and Revocable Landscape License

For pipelines, sewers, storm drains, overhead and underground cables, public trails, landscaping and other crossings or lateral encroachments.

Limited Land Use Permit

Provides for agricultural or other surface use of the right-of-way for a period not to exceed one year (vehicular parking is prohibited). These permits are renewable annually if inspection reveals satisfactory conformance to conditions of permit.

Easement

For streets, highways, large pipelines, canals and railroads, and other permanent publicly-owned encroachments. Easements are officially recorded with the county having jurisdiction. The consideration for the easement (e.g., fee) will be based on the value of the property being encumbered.

The Manager of Water Supply or Manager of Water Treatment and Distribution shall request review of any proposed revisions to application forms and lists of requirements from the Engineering and Construction Department, Real Estate Services Division, Office of General Counsel, and the District's Pipe Committee.

Processing Applications

Temporary Entry Permits

The Manager of Water Supply or Manager or Water Treatment and Distribution may issue temporary entry and construction permits including imposing standard and temporary conditions relating to the use. The Manager of Real Estate Services and the Office of General Counsel will be consulted regarding unusual circumstances.

Revocable Licenses

The Manager of Water Supply or Manager of Water Treatment and Distribution, if warranted, shall conduct a field investigation to determine pipeline protection requirements and in consultation with the Design Division or the Pipeline Infrastructure Division, will set forth the engineering and operating requirements.

The Manager of Water Supply or Manager of Water Treatment and Distribution, shall then specify any and all requirements, including special conditions to the applicant, and discuss the terms and conditions of the license agreement as well as any processing, design and inspection costs and license fee. The Manager of Water Supply or Manager of Water Treatment and Distribution may then enter into a standard license agreement with relevant special conditions on behalf of the District. The Manager of Real Estate Services and the Office of General Counsel shall be consulted regarding any unusual circumstances.

Copies of all revocable licenses issued by the Water Supply Division or the Water Treatment and Distribution Division shall be provided to the Manager of Real Estate Services.

Limited Land Use Permits

The Manager of Water Supply or Manager of Water Treatment and Distribution, shall convey the District's requirements to the applicant and investigate to determine any special conditions.

Real Estate Services shall prepare the Limited Land Use Permit (Form L-14) in duplicate, including special conditions or stipulations, accompanied by a District-prepared location sketch that will refer to pipeline stationing and other appropriate location identifiers, including adjacent pipeline structures.

Engineering and Construction Department shall prepare the location sketch.

After payment of the stipulated consideration determined by Real Estate Services, the Manager of Water Supply or Manager of Water Treatment and Distribution shall review and execute the permit. These copies are then returned to the Manager of Real Estate Services, together with any stipulated consideration.

Forty-five days before expiration of a Limited Land Use Permit, the Manager of Real Estate Services shall notify the Manager of Water Supply or Manager of Water Treatment and Distribution, who shall investigate the permittee's operations. If renewal of the permit is recommended, the permit will be renewed by letter from the Manager of Real Estate Services.

Leases and Easements

The Water Supply or Water Treatment and Distribution Divisions shall conduct a field investigation to determine requirements for pipeline protection and, in consultation with the Design Division or Pipeline Infrastructure Division, if necessary, will set forth the engineering and operating requirements.

If structural or corrosion protective facilities are required, the Manager of Water Supply or Manager of Water Treatment and Distribution shall request the Manager of Design Division or Pipeline Infrastructure Division to proceed with the required design or plan reviews. (During design, the designer will communicate with the applicant's engineer.) Upon completion of design, the plans will be delivered to the applicant via the Manager of Water Supply or Manager of Water Treatment and Distribution, who will arrange for inspection as required.

The Manager of Real Estate Services shall discuss with the applicant the terms of the agreement and the amount of the consideration, including any processing, design, and inspection costs. Real Estate Services shall obtain an appraisal and engineering estimates, if necessary.

Upon agreement with the applicant, the Manager of Real Estate Services, shall draft, for review and approval by the Manager of Water Supply Division or the Manager of Water Treatment and Distribution Division and Office of General Counsel, an agreement granting the applicant the property interest under the terms and for the consideration as approved. Real Estate Services shall assure that evidence of insurance is provided, if required. The lease or easement shall be submitted to the District's Board of Directors for approval, if required by Procedure 108, Real Estate Transactions. Two copies of the lease or easement shall be sent to the applicant with instructions to sign and return the copies, together with the consideration, to the Manager of Real Estate Services. Easements shall be recorded and the applicant shall provide the Manager of Real Estate Services with the recording data.

Approvals

District and non-District uses of pipeline right-of-ways shall be confirmed in writing, listing any special conditions which may apply to the proposed use to the requesting District departments or third parties by the Manager of Water Supply or Manager of Water Treatment and Distribution.

Terminations

Any third-party use of the District's pipeline property may be terminated at the District's sole discretion, so long as the termination is authorized by and done in a manner compliant with the terms and conditions of the permit, license, or lease that governs the use. If the Water Supply Division or the Water Treatment and Distribution Division terminates any permit or license, the Manager of Real Estate Services and the Design Division shall be so notified by memo. The Office of General Counsel may be consulted before undertaking a termination which may affect the District's legal interests.

Terms and Conditions

The final determination of generally applicable terms and conditions appropriate for District uses of pipeline properties rests with the Director of Operations and Maintenance.

A specific third party applicant for use of pipeline property may be required, as a condition of approval of the application, to comply with the generally applicable terms and conditions, or with different or additional terms and conditions that are determined to be in the District's best interest. The decision to approve or deny an application, and the selection of terms and conditions of any approval, shall rest with the Director of Operations and Maintenance. There is no right to an administrative appeal or hearing, and the decision of the Director or designee is final.

Records

The Manager of Real Estate Services shall maintain a file containing copies of all documents relating to right-of-way crossings or uses, except for temporary encroachment permits, and is responsible for the assignment of right-of-way crossing numbers to approved documents.

The Engineering and Construction Department shall maintain as-built and right-of-way drawings and other information of pipelines. Updates to these drawings shall be made following:

1. Grant of Revocable License or Easement. Notice to be supplied by the Manager of Real Estate Services.

2. Completion of crossing construction covered by license or easement. Notice, including “as built” location data, to be supplied by the applicant to the Water Supply Division or Water Treatment and Distribution Division for transmittal to the Engineering and Construction Department. This notice will be routed through the Engineering and Construction Department, as necessary, then to the Manager of Real Estate Services.

3. Termination of any pipeline right-of-way use. Notice to be supplied by the Manager of Real Estate Services.

Required Fees

Pipeline right-of-way fees for the processing of applications and documents related to proposed uses are included in the “Water and Wastewater System Schedules of Rates and Charges, Capacity Charges, and Other Fees”. The Manager of Water Supply and Manager of Water Treatment and Distribution are responsible for periodic review and updating of Requirements for Entry or Use. The Manager of Real Estate Services is responsible for review and updating of Fees and Documentation Charges, Use of Aqueduct and Distribution Pipeline Rights-of-Way by Others.

References

Policy 7.01 – Aqueduct and Distribution Pipeline Rights-of-Way Maintenance
Procedure 108 – Real Estate Transactions
Procedure 436 – Miscellaneous Accounts Receivable and Cash Receipts
Procedure 706 – Facilities: Inspection, Maintenance and Repair
Requirements for Entry or Use of Pipeline Rights-of-Way (attached)
Water and Wastewater System Schedules of Rates and Charges, Capacity Charges, and Other Fees (as updated periodically)

EBMUD REQUIREMENTS FOR
ENTRY OR USE OF **PIPELINE RIGHTS-OF-WAY**

East Bay Municipal Utility District

1. Requests for encroachment rights or for other uses of the District's raw and distribution water aqueduct and pipeline ("pipeline") properties shall be directed to the Manager of Water Supply, 1804 West Main Street, Stockton, California 95203. Property uses shall only be permitted subject to appropriate written permit, license, easement, or lease agreement.

2. Requests for property uses shall be in writing and accompanied by a completed application, application fees, plan and profile drawings of the area and work involved. District pipeline stationing and adjacent above-ground structures must be shown. Applicant's horizontal and vertical control must be correlated to the District's. Drawings and maps shall be ANSI D size (22x34 inch) or ANSI B size (11x17 inch) and must also be provided in electronic .pdf format. Application must include complete insurance documentation.

3. The applicant must indemnify, defend, and hold harmless the District and associated personnel from and against any claims, losses, and liability arising by reason of the applicant's use of District's property or the applicant's acts or omissions pursuant to any permit or approval issued by the District, on such terms as the District may require. The applicant may be required to provide evidence of insurance coverage.

4. All requests for uses of District property must be consistent with requirements and limitations set forth by Procedure 718 and will be reviewed and approved on a case-by-case basis.

5. District land and facilities shall be restored to a condition as good as that which existed before applicant's entry on the right-of-way.

6. Applicant's use of property shall not increase District costs or interfere with District access, operations, maintenance, or repair of its facilities.

7. The applicant must pay the District the appraised value of the easement or lease, if appropriate, for the rights granted to the applicant. Appropriate environmental documentation must be completed in accordance with the California Environmental Quality Act before the rights can be granted. The District may require the applicant to prepare the documentation at its expense before the application will be considered for approval. The District will review the environmental documentation to determine whether it (i) adequately describes the applicant's project, (ii) contains a detailed disclosure and analysis of the project's impacts, (iii) describes feasible measures to mitigate any construction impacts to the District's right-of-way to a level of no significant impact, and (iv) is otherwise legally sufficient. The District may rely on any existing environmental documentation for the applicant's project if the District determines that the existing documentation meets the above-described standards.

8. For any District-approved encroachment, the applicant must pay the District for any of the following measures, as determined necessary by the District:

    a. Design of structural protective measures
    b. Design of fences or other structures
    c. Corrosion control protective measures
    d. District engineering, plan review, and inspection of activities
    e. Environmental documentation
    f. Application, permit or license fees.

9. The plan for the execution of the work must be approved by the District.

10. The type and weight of equipment working over the pipelines must be approved by the District.

11. The use of vibratory compaction equipment is prohibited on the pipeline right-of-way unless otherwise approved by EBMUD. Allowable compaction effort, allowable equipment, and maximum depth of each lift of fill shall be subject to District review and approval before start of construction.

12. A minimum of 48 hours notice must be given to the District before work commences on District pipeline right-of-way. Contact information will be provided in permit.

13. A minimum of 48 hours notice must be given to the District before work commences on District pipeline right-of-way. Contact information will be provided in permit.

14. A preconstruction meeting is required prior to start of work.

15. No building or portions of buildings shall be constructed on the property. No other types of structures shall be constructed unless specific approval is given by the District.

16. No longitudinal encroachments such as drainage ditches; gas, phone, or electrical lines; pipelines, or roads will be permitted. All property line fences (including footings) must be located completely outside pipeline property lines.

17. District staff shall monitor pile driving or other work which can result in vibration and occurs within 100 feet of the aqueducts. District staff shall also monitor other work located within 100 feet of the pipeline right-of-way, if such work has the potential to result in ground movements that could damage the District's facilities (i.e., large excavations with potential for horizontal or vertical ground deformations within the District's rights-of-way).

18. Railroad, freeway and highway crossings of the pipeline right-of-way shall be on permanent bridges with a minimum vertical clearance of 14 feet 6 inches between the finished ground surface and the underside of the bridge. Crossings of pipeline rights of way, on grade will be over structurally-encased aqueducts with a sleeve for a fourth aqueduct.

19. Street and road crossings constructed on grade shall incorporate protection of the pipelines. Protective measures will be designed by applicant's licensed engineer to District standards with specific District approval of each design.

20. Existing pipeline protective measures such as concrete slabs shall not be cut, penetrated, or otherwise disturbed. If a protective measure is cut, penetrated, or disturbed, it shall be replaced with a new protective measure, designed by applicant's licensed engineer to District standards with specific District approval of design.

21. Traffic control fences or approved barriers shall be installed along each side of the street, road or trail before opening to the public.

22. Temporary construction fences and barricades shall be installed by contractor as directed by the District.

23. No geotechnical exploration such as drilling or boring shall be allowed on an pipeline right-of-way without prior written approval from the District.

24. Any changes in finished grade in the pipeline right-of-way must be approved by the Aqueduct Section. Earth fills or cuts on adjacent property shall not encroach onto District property except where authorized for vehicular crossings on grade and where the District determines that there will be no detrimental effect on or maintenance of the pipelines.

25. Crossings shall be perpendicular to the pipelines and on a constant grade across District property.

26. Sanitary sewers, water lines, petroleum product lines, or other lines crossing above the pipelines must be encased in a steel, polyvinyl chloride (PVC), or reinforced concrete pipe conduit or be imbedded in reinforced concrete with a minimum vertical clearance of two (2) feet between the casing/embedment and the top of District pipelines. The casing shall extend the entire width of the pipelines right-of-way.

27. All pipelines crossing below the pipelines must be encased in a steel or reinforced concrete conduit and provide a minimum of three (3) feet of clearance between the casing and the bottom of the District pipelines.

28. Trenchless construction methods such as horizontal directional drilling or jack-and-bore between the top of the pipelines and the bottom of the protective structure (slab) are prohibited.

29. On pressurized pipe crossings, shutoff valves shall be provided outside and adjacent to both sides of District property.

30. At the point of crossing, steel pipeline crossings and steel casings shall incorporate electrolysis test leads, bond leads, and leads necessary for interference testing. Corrosion control devices, when required, must be approved by the District.

31. Cathodic protection for steel encasements must be installed as follows:

    - Provide a dielectric coating to the exterior surface of the steel casing within the District's right-of-way, 16 mil epoxy or equivalent.
    - Provide galvanic protection to the portion of the steel casing within the District's right-of-way in accordance with the National Association of Corrosion Engineers RP-01-69.
    - If the carrier pipe is constructed of ductile iron or steel, provide electrical isolation between the carrier and casing using casing insulators; redwood skids are not permitted.
    - Provide test results to the District demonstrating the adequacy of the cathodic protection system, and the adequacy of the electrical isolation of the carrier (if metallic) from the casing. The District reserves the right to witness any such tests.

32. Gravity drainage of District property shall be maintained. Open channels constructed across the right-of-way shall be paved with reinforced concrete. Headwalls, inlets, and other appurtenances shall be located outside District property. Drainage facilities shall be provided outside the District's property at the top and/or toe of fill slopes or cuts constructed adjacent to District property to assure adequate drainage.

33. Overhead electrical power conductors across the property shall be a minimum of 30 feet above ground. Communication and cable TV crossings shall be a minimum of 20 feet above the ground. Supporting poles or towers shall be located outside the pipelines right-of-way.

34. Buried electrical cables passing over the pipelines shall be installed in PVC conduit and encased in red concrete across the entire width of the right-of-way. In some cases, PVC-coated steel conduit with a red concrete cap may be substituted. All other buried cables shall be installed in conduits and marked in the appropriate Underground Service Alert (USA) colored marking materials and with surface signs installed at 4-foot intervals that include the utility name, type, and emergency contact information across the entire width of the right-of-way. The minimum vertical clearance between the conduit and the top of the District's pipelines is two (2) feet.

35. Electrical or telecommunications cables shall not be allowed to pass under the pipelines.

36. Vehicular parking and storage of equipment or material on aqueduct or distribution pipelines property are prohibited.

37. All District survey monuments and markers shall be undisturbed. If any District survey markers or monuments must be disturbed, they will be replaced or relocated by the District at applicant's expense prior to the start of any ground disturbing work.

38. All pipeline crossings involving mechanical excavation on the right-of-way require potholing of all pipelines at the site of the proposed crossing. Visible reference markings showing the pipeline alignments and depths to top of pipe shall be maintained for the duration of any mechanical excavation on District property. Excavations within two (2) feet of pipelines shall be made by hand. Entry permits are required for pothole work.

39. All grading or excavating of the right-of-way requires USA notification and the maintenance of a current inquiry identification number.

40. Certified six-sack mix is the minimum acceptable concrete batch to be used on the pipelines right-of-way. Concrete compression strength shall be 3,000 per square inch (PSI) or better at 28 days. If samples do not reach 3,000 PSI at 28 days, the entire section of slab or encasement related to that sample must be removed and replaced at applicant's expense.

41. Each truckload of concrete to be placed on the right-of-way may be sampled by the District. No water may be added to the mix after sampling.

42. Maximum allowable slump is three inches. All concrete exceeding three inches will be rejected and cannot be used on the right-of-way.

43. No traffic will be allowed over protective slabs until 3,000 PSI is reached.

44. All work areas shall be inspected by the District for final approval. As-built drawing submittals are required for District approval.

45. No work is allowed on weekends or District-recognized holidays unless otherwise authorized in the required permit.

California Department of Transportation

DISTRICT 4
OFFICE OF REGIONAL AND COMMUNITY PLANNING
P.O. BOX 23660, MS–10D | OAKLAND, CA 94623-0660
www.dot.ca.gov

October 20, 2023

SCH #: 2023090467
GTS #: 04-CC-2023-00721
GTS ID: 30908
Co/Rt/Pm: CC/VAR/VAR

Will Nelson. Principal Planner
County of Contra Costa
30 Muir Road
Martinez, CA 94553

Re: Contra Costa County 2045 General Plan and Climate Action Plan Updates – Notice of Preparation (NOP) of a Draft environmental Impact Report (DEIR)

Dear Will Nelson:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Contra Costa County 2045 General Plan (GP) and Climate Action Plan (CAP) Updates. We are committed to ensuring that impacts to the State's multimodal transportation system and to our natural environment are identified and mitigated to support a safe, sustainable, integrated and efficient transportation system.

The Local Development Review (LDR) Program reviews land use projects and plans to ensure consistency with our mission and state planning priorities. The following comments are based on our review of the September 2023 NOP.

Project Understanding

The County of Contra Costa is preparing comprehensive updates to its existing GP and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas emissions and enhance community resiliency. Contra Costa County's existing GP was adopted in 1991, with minor revisions in 2005. The Housing Element is being updated in parallel to the rest of the GP. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

Travel Demand Analysis
With the enactment of Senate Bill (SB) 743, Caltrans is focused on maximizing efficient development patterns, innovative travel demand reduction strategies, and multimodal improvements. For more information on how Caltrans assesses Transportation Impact Studies, please review Caltrans' Transportation Impact Study Guide (*link*).

If the project meets the screening criteria established in the County's adopted Vehicle Miles Traveled (VMT) policy to be presumed to have a less-than-significant VMT impact and exempt from detailed VMT analysis, please provide justification to support the exempt status in alignment with the City's VMT policy. Projects that do not meet the screening criteria should include a detailed VMT analysis in the DEIR, which should include the following:

- VMT analysis pursuant to the City's guidelines. Projects that result in automobile VMT per capita above the threshold of significance for existing (i.e. baseline) city-wide or regional values for similar land use types may indicate a significant impact. If necessary, mitigation for increasing VMT should be identified. Mitigation should support the use of transit and active transportation modes. Potential mitigation measures that include the requirements of other agencies such as Caltrans are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the City.

- A schematic illustration of walking, biking and auto conditions at the project site and study area roadways. Potential traffic safety issues to the State Transportation Network (STN) may be assessed by Caltrans via the Interim Safety Guidance (*link*).

- The project's primary and secondary effects on pedestrians, bicycles, travelers with disabilities and transit performance should be evaluated, including countermeasures and trade-offs resulting from mitigating VMT increases. Access to pedestrians, bicycle, and transit facilities must be maintained.

Multimodal Transportation Planning
Please review and include the reference to the *Caltrans District 4 Pedestrian Plan* (2021) and the *Caltrans District 4 Bike Plan* (2018) in the DEIR. These two plans studied existing conditions for walking and biking along and across the State Transportation Network (STN) in the nine-county Bay Area and developed a list of location-based and prioritized needs.

Please note that any Complete Streets reference should be updated to reflect Caltrans Director's Policy 37 (*link*) that highlights the importance of addressing the needs of non-motorists and prioritizing space-efficient forms of mobility, while also facilitating goods movement in a manner with the least environmental and social

impacts. This supersedes Deputy Directive 64-R1, and further builds upon its goals of focusing on the movement of people and goods.

Lead Agency

As the Lead Agency, the County of Contra Costa is responsible for all project mitigation, including any needed improvements to the State Transportation Network (STN). The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter or for future project referrals, please contact LDR-D4@dot.ca.gov.

Sincerely,



YUNSHENG LUO
Branch Chief, Local Development Review
Office of Regional and Community Planning

c: State Clearinghouse

From:	Bush, Eva@DeltaCouncil
To:	Advance Planning
Subject:	Comments on the NOP of EIR for the CCC 2045 General Plan and Climate Action Plan update
Date:	Friday, October 20, 2023 10:31:44 AM
Attachments:	image001.png 2023-10-20 CCC 2045 GP & CAP NOP_commentletter_DSC_ADA.pdf

Good Morning,

Thank you for the opportunity to comment on the Notice of Preparation of the EIR for the Contra Costa County 2045 General Plan and Climate Action Plan update.

Enclosed, please find our comment letter.

Thank you,

Eva E. Bush (She/Her/Hers)
Environmental Program Manager
Delta Stewardship Council
Planning & Performance Division

C: (916) 284-1619

715 P Street, 15-300
Sacramento, CA 95814

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Maria Mehranian
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EXECUTIVE OFFICER
Jessica R. Pearson

October 20, 2023

County of Contra Costa
Department of Conservation and Development
30 Muir Street
Martinez, CA 94553

Delivered via email: AdvancePlanning@dcd.cccounty.us

RE: Comments on Notice of Preparation of an Environmental Impact Report for the Contra Costa County 2045 General Plan and Climate Action Plan Update, SCH# 2023090467.

Dear Will Nelson:

Thank you for the opportunity to review and comment on the Contra Costa County (County) 2045 General Plan and Climate Action Plan Update Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR). The Delta Stewardship Council (Council) staff appreciates the level of coordination with County staff to date on this project. The Council recognizes the objective of the project, as described in the NOP, for the County to provide comprehensive updates to its existing General Plan and Climate Action Plan that establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions while enhancing community resiliency. The Council is an independent state agency established by the Sacramento-San Joaquin Delta Reform Act of 2009, codified in Division 35 of the California Water Code, sections 85000-85350 (Delta Reform Act). The Delta Reform Act charges the Council with furthering California's coequal goals of providing a more reliable water supply and protecting, restoring, and enhancing the Sacramento-San Joaquin River Delta (Delta) ecosystem. (Water Code, § 85054.) The

Delta Reform Act further states that the coequal goals are to be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. The Council is charged with furthering California's coequal goals for the Delta through the adoption and implementation of the Delta Plan. (Wat. Code, § 85300.)

The Delta Plan contains regulatory policies, which are set forth in California Code of Regulations, Title 23, sections 5001-5015. Through the Delta Reform Act, the Council was granted specific regulatory and appellate authority over certain actions of State or local public agencies that take place in whole or in part in the Delta. (Wat. Code, §§ 85210, 85225.30.) A state or local agency that proposes to undertake a covered action is required to prepare a written Certification of Consistency with detailed findings as to whether the covered action is consistent with the Delta Plan and submit that Certification to the Council prior to initiation of the implementation of the project. (Wat. Code, § 85225.) The Delta Reform Act also directs the Council to review and provide timely advice to local and regional planning agencies regarding the consistency of local and regional planning documents with the Delta Plan. (Wat. Code, § 85212.)

COVERED ACTION DETERMINATION AND CERTIFICATION OF CONSISTENCY WITH THE DELTA PLAN

Based on the project location and scope, as provided in the NOP, the project may meet the definition of a covered action. Water Code section 85057.5(a) states that a covered action is a plan, program, or project, as defined pursuant to Section 21065 of the Public Resources Code that meets all of the following conditions:

(1) Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh. The project would occur in part within the boundaries of the Delta.

(2) Will be carried out, approved, or funded by a State or a local public agency. The County would approve the 2045 General Plan and Climate Action Plan Updates.

(3) Is covered by one of the provisions of the Delta Plan. Although we anticipate that the project would be covered by multiple Delta Plan regulatory policies, additional project details are needed to determine which policies would apply.

(4) Will have a significant impact on achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and State interests in the Delta. The project may have a significant impact on achievement of the coequal goal to protect, restore,

and enhance the Delta ecosystem, and the implementation of government-sponsored flood control programs in the Delta.

The State or local agency approving, funding, or carrying out the project must determine if that project is a covered action and, if so, file a certification of consistency with the Council prior to initiating project implementation. (Wat. Code, § 85225; Cal. Code Regs., tit. 23, § 5001(j)(3).) Additional project details contained in the forthcoming DEIS will be helpful in determining applicable Delta Plan policies supporting this determination.

As the County proceeds with design, development, and environmental impact analysis of the project, the Council invites the County to continue to engage Council staff in early consultation to discuss project features and mitigation measures that would promote consistency with the Delta Plan.

More information on covered actions, early consultation, and the certification process can be found on the Council website, https://coveredactions.deltacouncil.ca.gov.

Council staff are available to discuss issues outlined in this letter as the County proceeds in the next stages of its project and approval processes. Please contact Pat Kelly at 916-902-6577 or Patricia.Kelly@deltacouncil.ca.gov with any questions.

Sincerely,



Jeff Henderson, AICP

Deputy Executive Officer

Appendix 5.3-1 Air Quality and Greenhouse Gas Emissions Data

Appendices

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Land Use Statistics - Contra Costa County

	Existing Conditions	Buildout Estimates	Projected Growth (Proposed Project)	
	2019	2045	2019-2045	%
Housing Units	60,315	83,504	23,189	38%
Population	174,145	239,718	65,573	38%
Employment	38,757	48,153	9,396	24%
Service Population	**212,902**	**287,871**	**74,969**	35%

AQMP Consistency Analysis

Comparison of the Change in Population and VMT in Contra Costa (O-D Method)

Category	Existing	2045 Proposed	2045 Change from Existing	
			Change	Percent
Population	174,145	239,718	65,573	38%
Employment	38,757	48,153	9,396	24%
SP	212,902	287,871	74,969	35%
VMT per Day	3,530,197	4,272,206	742,009	21%
VMT/person	20.3	17.8	-2.4	-12%
VMT/SP	16.6	14.8	-1.7	-10%

Note Origin-Destination (O-D) Methodology is not the same methodology for SB 743, which considers only commute-trip VMT. VMT

Modeling of vehicle miles traveled (VMT) is provided by Fehr and Peers is based on the Contra Costa County Transportation Authority's Contra Costa Transportation Analysis Guidelines. VMT from passenger vehicles and trucks that have an origin or destination in the County using a transportation origin-destination methodology. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375). For accounting purposes, there are three types of trips:

» Vehicle trips that originated and terminated within the County (Internal-Internal, I-I). Using the accounting rules established by RTAC, 100 percent of the length of these trips, and their emissions, are attributed to the County.

» Vehicle trips that either originated or terminated (but not both) within the County (Internal-External or External-Internal, I-X and X-I). Using the accounting rules established by RTAC, 50 percent of the trip length for these trips is attributed to the County.

» Vehicle trips that neither originated nor terminated within the County. These trips are commonly called pass-through trips (External-External, X-X). Using the accounting rules established by RTAC, these trips are not counted towards the County's VMT or emissions.

Contra Costa Community GHG Emissions Inventory and Forecast

Category					With State and Regional Actions				With State and Regional Actions			
	2005		Existing		2030		Change from Existing (2030)		2045		Change from Existing (2045)	
	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
On-Road Transportation	628,200	49%	464,040	44%	542,020	45%	77,980		605,080	44%	141,040	30%
Residential Energy	294,930	23%	191,780	18%	217,710	18%	25,930		259,380	19%	67,600	35%
Nonresidential Energy	118,740	9%	159,520	15%	167,720	14%	8,200		180,200	13%	20,680	13%
Solid Waste	243,940	19%	220,760	21%	229,450	19%	8,690		260,490	19%	39,730	18%
Agriculture	33,350	3%	36,130	3%	34,770	3%	-1,360		33,410	2%	-2,720	-8%
Off-road Equipment	34,160	3%	54,010	5%	69,520	6%	15,510		76,100	6%	22,090	41%
Water and Wastewater	8,080	1%	4,870	0%	5,530	0%	660		6,590	0%	1,720	35%
BART	1,040	0%	190	0%	220	0%	30		260	0%	70	37%
Land Use and Sequestration	-70,860	-5%	-70,860	-7%	-67,580	-6%	3,280		-58,890	-4%	11,970	-17%
Total Community Emissions	**1,291,580**	100%	**1,060,440**	100%	**1,199,360**	100%	**138,920**		**1,362,620**	100%	**302,180**	28%
Total Community Emissions with State Actions	**NA**		**NA**		**1,013,840**		**-46,600**		**879,280**		**-181,160**	
Residents	154,270		174,145		199360				239,718		65,573	38%
$MTCO_2e$/capita	8.4		6.1		6.0				5.7		-0.4	-7%
Trajectory to AB 32, SB 32 and AB 1279					**658,700**	40% below 1990 levels			**164,680**	85% below 1990 levels		
Achieves Target without State Actions?					**No**				**No**			
Reductions from Existing and Planned Actions					185,520				483,340			
Reductions from CAP GHG Reduction Strategies					355,540				721,670			
Total GHG emissions with Existing and Planned Actions & CAP GHG Reduction Strategies					**658,300**				**157,610**			
$MTCO_2e$/capita									**0.66**			
Achieves Target with Existing and Planned Actions?					**Yes**				**Yes**			

Source: Based on the emissions inventory and forecast being conducted for the County's Climate Action Plan Update.

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Fifth Assessment Report (AR5).

The emissions inventory and forecast is based on activity data for Contra Costa County. This emissions inventory methodology identifies GHG emissions produced within a jurisdiction and captures direct and indirect emissions generated by land uses in a community. The activity data methodology allows a direct comparison between a community's GHG emissions and that identified by CARB in the SB 32 and AB 1279 inventory and forecast prepared for the scoping plan. Unlike a "consumption-based" GHG emissions inventory, an activity-based emissions inventory does not capture lifecycle emissions associated with consumptions of goods. While a consumption-based emissions inventory approach may document GHG emissions associated with the final demand (regardless of where the were generated), a consumption-based emissions inventory excludes emissions associated with products produced within the jurisdiction but consumed elsewhere. For these reasons, an activity-based emissions inventory was determined to be most applicable for determining significant impacts under CEQA.

Unincorporated Contra Costa County GHG emissions in 2005 were 1,291,580 MTCO2e, translating to a 1990 GHG emissions level of 1,097,840 MTCO2e

Note: Excludes GHG emissions natural gas use from Permitted Sources within the County

County of Contra Costa Community Criteria Air Pollutant Emissions Inventory and Forecast

Sources

[1] Source: Fehr and Peers 2023; EMFAC2021 Version 1.0.2 Emissions Database (County - Contra Costa)

[2] Sources: Natural Gas Use based on the Climate Action Plan Update. CalEEMod User's Guide for natural gas criteria air pollutant emission rates. Excludes criteria air pollutant emissions natural gas use from Permitted Sources within the County.

[3] Source: OFFROAD 2021.

[4] Source: CalEEMod User's Guide

EXISTING (2019)

Phase	Existing Criteria Air Pollutant Emissions (lbs/day)				Existing Criteria Air Pollutant Emissions (tons/year)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Transportation[1]	234	1,193	151	57	41	207	26	10
Energy[2]	60	1,129	84	84	11	206	15	15
Residential Fuels (wood, kerosene, propane)	4,152	84	629	629	758	15	115	115
Offroad Equipment[3]	17	16	1	1	3	3	0	0
Consumer Products[4]	2,432				444			
Total	**6,895**	**2,422**	**865**	**771**	**1,256**	**431**	**156**	**140**

EXISTING LAND USES (2045 Emission Rates)

Phase	Existing (2045) Criteria Air Pollutant Emissions (lbs/day)				Existing (2045) Criteria Air Pollutant Emissions (tons/year)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Transportation[1]	47	201	136	44	8	35	24	8
Energy[2]	60	1,129	84	84	11	206	15	15
Residential Fuels (wood, kerosene, propane)	4,152	84	629	629	758	15	115	115
Offroad Equipment[3]	17	16	1	1	3	3	0	0
Consumer Products[4]	2,432				444			
Total	**6,708**	**1,430**	**850**	**758**	**1,224**	**259**	**154**	**138**

Year 2045

Phase	Project (2045) Criteria Air Pollutant Emissions(lbs/day)				Project (2045) Criteria Air Pollutant Emissions (tons/year)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Transportation[1]	57	247	164	53	10	43	28	9
Energy[2]	70	1,307	98	98	13	239	18	18
Residential Fuels (wood, kerosene, propane)	4,152	84	629	629	758	15	115	115
Offroad Equipment[3]	23	17	1	1	4	3	0	0
Consumer Products[4]	3,730				681			
Total	**8,032**	**1,656**	**891**	**780**	**1,465**	**300**	**161**	**142**

County of Contra Costa Community Criteria Air Pollutant Emissions Inventory and Forecast

Net Change (No Project)

Phase	Net Change (2040-2040 No Project) Criteria Air Pollutant Emissions (lbs/day)				Net Change (2040-2040 No Project) Criteria Air Pollutant Emissions (tons/year)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Transportation[1]	10	46	28	9	2	8	5	2
Energy[2]	10	178	13	13	2	33	2	2
Residential Fuels (wood, kerosene, propane)	0	0	0	0	0	0	0	0
Offroad Equipment[3]	5	1	0	0	1	0	0	0
Consumer Products[4]	1,299				237			
Total	**1,324**	**225**	**42**	**23**	**241**	**41**	**7**	**4**
BAAQMD THRESHOLD	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Increase from Baseline?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

NET CHANGE (from Existing)

Phase	Net Change (2045-Existing) Criteria Air Pollutant Emissions(lbs/day)				Net Change (2045-Existing) Criteria Air Pollutant Emissions (tons/year)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Transportation[1]	-176	-946	13	-4	-31	-164	2	-1
Energy[2]	10	178	13	13	2	33	2	2
Residential Fuels (wood, kerosene, propane)	0	0	0	0	0	0	0	0
Offroad Equipment[3]	5	1	0	0	1	0	0	0
Consumer Products[4]	1,299	0	0	0	237	0	0	0
Total	**1,137**	**-766**	**26**	**10**	**209**	**-131**	**5**	**2**
BAAQMD THRESHOLD	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Increase from Existing	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Criteria Air Pollutants from Natural Gas

Rate	lbs/MMBTU					
Natural Gas	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	0.005	0.092	0.039	0.001	0.007	0.007
Non-Residential	0.005	0.098	0.082	0.001	0.007	0.007
Sources CalEEMod Version 2022.1, 2022, Appendix C. https://www.caleemod.com/documents/handbook/appendices/appendix_c.pdf						

	With State Actions	
Contra Costa	Existing	Year 2045
	Therms	
Residential	30,100,640	35,500,210
Nonresidential	13,784,410	15,356,900
Total	**43,885,050**	**50,857,110**

Natural Gas	Existing tons/year					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	8	138	59	2	11	11
Nonresidential	3	68	57	1	5	5
TOTAL	**11**	**206**	**115**	**2**	**15**	**15**

Natural Gas	2045 tons/year					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	9	163	69	2	12	12
Nonresidential	4	75	63	1	5	5
TOTAL	**13**	**239**	**132**	**3**	**18**	**18**

Fuel Use for Residential Homes

Emission Factors

Source: CalEEMod 2022 User's Guide and 2018 US Energy Information Administration. Residential Energy Consumption Survey.

	Unit	ROG lbs/unit	NOx lbs/unit	CO lbs/unit	SO2 lbs/unit	PM10 lbs/unit	PM2.5 lbs/unit
Propane	MMBTU	0.011	0.142	0.082	0	0.008	0.008
Wood	Tons	229	2.6	252.6	0.4	34.6	34.6

Source Kerosene: AP 42. Volume I. 1.3, Fuel Oil Combustion.

	Unit	ROG lbs/unit	NOx lbs/unit	CO lbs/unit	SO2 lbs/unit	PM10 lbs/unit	PM2.5 lbs/unit
Kerosene (Residential Furnace)	1000 gallons	NA	18	5	0.568	0.4	0.4

Assumes low-sulfur kerosene in California with a sulfur content of no more than 0.04% by weight. Assume PM2.5 is 100% of PM10

Activity Data - Residential Fuel Use

Activity Data Source: Contra Costa County Climate Action Plan Update

Conversions Factors: California Air Resources Board. 2010, May. Local Government Operations Protocol, for the quantification and reporting of greenhouse gas emissions inventories. Version 1.1.

Wood Burning	Existing	Year 2045	Existing	Year 2045
	MMBTU		Tons	
Wood Burning	101,710	101710	6,613	6,613
Note: residential woodburning is decreasing in the County				

Kerosene	Existing	Year 2045	Existing	Year 2045
	Gallons		1000 Gallons	
Residential - Kerosene	16,320	16,320	16	16

Propane	Existing	Year 2045	Existing	Year 2045
	Gallons		MMBTU	
Residential - Propane	1,021,340	1,021,340	92,942	92,942

Fuel Use	Existing tons/year					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Woodburning	757	9	835	1	114	114
Kerosene	NA	0.147	0.041	0.005	0.003	0.003
Propane	1	7	4	0	0	0
TOTAL	**758**	**15**	**839**	**1**	**115**	**115**

Natural Gas	2045 tons/year					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Woodburning	757	9	835	1	114	114
Kerosene	NA	0.147	0.041	0.005	0.003	0.003
Propane	1	7	4	0	0	0
TOTAL	**758**	**15**	**839**	**1**	**115**	**115**

Area Sources - Residential Consumer Product Use[a]

Emissions = EF x Building Area

EF = 2.14E-05 lbs/sqft/day

Sources/Notes:

a. California Emissions Estimator Model, Version 2021.1, Users Guide. Appendix D3.

AVERAGE HOUSING SQFT ASSUMPTIONS

Year Structure was Built	Percent of Housing Stock [a]	Average Square Feet of New Single Family Homes[b]	Average Square Feet (Weighted)
2014 or Later	1.4%	2,617	37
2010 to 2013	1.8%	2,467	44
2000 to 2009	11.8%	2,404	284
1990 to 1999	12.4%	2,116	262
1980 to 1989	15.9%	1,819	289
1970 to 1979	18.9%	1,699	321
1960 to 1969	14.1%	1,715	242
1950 to 1959	12.8%	1,715	220
1940 to 1949	6.5%	1,715	111
1939 or earlier	4.3%	1,715	74
	100%		1,884

Sources/Notes: https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/

a. United States Census Bureau, Selected Housing Characteristics, Contra Costa County, 2019. Table DP04. American Community Survey 5-Year Estimates, Year structure built.

https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2019/

b. United States Census Bureau, Characteristics of New Housing, Characteristics of New Single-Family Houses Completed, Median and Average Square Feet by Location. https://www.census.gov/construction/chars/pdf/c25ann2016.pdf

	2019 Existing	2045
	TOTAL	TOTAL
Housing Units	60,315	83,504
Residential SQFT	113,637,220	174,315,103
lbs VOC per day	2,432	3,730
tons VOC/year	444	681

Notes:

[1] New housing units constructed post-2014 assumed to be 2,617 square feet (based on Source 2).

[2] Daily emissions converted to annual emissions by multiplying by 365 days/year.

Area Sources

Source: OFFROAD2021. https://arb.ca.gov/emfac/emissions-inventory/2f6c8fa1b8ec8bd9f8a4f23b3d84c74a77f77161

OFFROAD2021 Estimate based on:

Agricultural Equipment	Based on agricultural acreage within Contra Costa County
Construction Equipment	Based on housing permits in Contra Costa County
Light Commercial and Industrial Equipment	Based on employment in Contra Costa County
Lawn & Garden	Based on housing units in Contra Costa County

Sources

Farmland Acreage

Source: Department of Conservation and Development, Contra Costa County, 2022. 2019 Report on Agriculture. https://www.contracosta.ca.gov/DocumentCenter/View/70326/2019-Crop-Report-.

Source: Department of Conservation and Development, Contra Costa General Plan Land Use Element Map. https://www.contracosta.ca.gov/DocumentCenter/View/30949/Land-Use-Element-Map-PDF?bidId=.

Source: Buildout Land Use Map.

Existing Farmland (unincorporated)	117,306	
Farmland Acreage at Buildout at 2045	107,866	92%
Percent Reduction	-8.05%	

Construction (Housing Permits)

Source: Housing and Urban Development (HUD). 2022, Accessed June 23. SOCDS Building Permits Database. https://socds.huduser.gov/permits/

Employment

Source. U.S. Census Bureau. Longitudinal Employer-Household Dynamics. 2020 Q1. http://lehd.ces.census.gov/

Source: Fehr and Peers 2023

2019 Existing		**ROG Exhaust**	**NO_x Exhaust**	**CO Exhaust**	**SO_2 Exhaust**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust***
		Tons/year					
Agricultural		0.04	0.24	0.24	0.00	0.01	0.01
Construction Equipment		0.20	1.69	2.45	0.00	0.09	0.08
Lawn & Garden		2.12	0.25	20.96	0.00	0.02	0.02
Light Commercial / Industrial Equipment		0.78	0.75	31.60	0.00	0.02	0.01
TOTAL		3	3	55	0	0.14	0.12

2045	**Forecast Adjusted for:**	**ROG Exhaust**	**NO_x Exhaust**	**CO Exhaust**	**SO2 Exhaust**	**PM10 Exhaust**	**PM2.5 Exhaust***
		Tons/year					
Agricultural	Based on a reduction in Agricultural land in the County	0.04	0.22	0.22	0.00	0.01	0.01
Construction Equipment	Similar to historic	0.20	1.69	2.45	0.00	0.09	0.08
Lawn & Garden	Proportional to housing growth	2.93	0.35	29.02	0.00	0.03	0.03
Light Commercial / Industrial Equipment	Proportional to employment growth	0.97	0.93	39.26	0.00	0.02	0.02
TOTAL		4	3	71	0	0.16	0.13

Contra Costa County OFFROAD2021

Source: https://arb.ca.gov/emfac/emissions-inventory/2f6c8fa1b8ec8bd9f8a4f23b3d84c74a77f77161
Construction includes: Over 25 horsepower, self-propelled, diesel equipment only subjected to In-Use Regulation; AND Under 25 horsepower equipment not subject to the In-Use Regulation

Model Output: OFFROAD2021 (v1.0.2) Emissions Inventory
Region Type: County
Region: Contra Costa
Calendar Year: 2019
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Agriculture

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd
Contra Costa	2019	Agricultural - Agricultural Tractors	Aggregate	Aggregate	Gasoline	46.599	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Agricultural Tractors	Aggregate	Aggregate	Diesel	775,488.169	0.030	0.186	0.141	0.000	0.011	0.010
Contra Costa	2019	Agricultural - ATVs	Aggregate	Aggregate	Gasoline	20,703.139	0.006	0.003	0.060	0.000	0.000	0.000
Contra Costa	2019	Agricultural - ATVs	Aggregate	Aggregate	Diesel	10,088.287	0.000	0.002	0.002	0.000	0.000	0.000
Contra Costa	2019	Agricultural - ATVs	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Bale Wagons (Self Propelled)	Aggregate	Aggregate	Diesel	2,582.452	0.000	0.001	0.000	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Balers (Self Propelled)	Aggregate	Aggregate	Diesel	203.530	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Combine Harvesters	Aggregate	Aggregate	Diesel	37,171.700	0.001	0.008	0.005	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Construction Equipment	Aggregate	Aggregate	Diesel	19,338.362	0.001	0.005	0.003	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Cotton Pickers	Aggregate	Aggregate	Diesel	723.517	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Forage & Silage Harvesters	Aggregate	Aggregate	Diesel	7,061.408	0.000	0.002	0.001	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Forklifts	Aggregate	Aggregate	Diesel	15,732.147	0.001	0.004	0.003	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Hay Squeeze/Stack Retriever	Aggregate	Aggregate	Diesel	2,469.114	0.000	0.001	0.000	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Nut Harvester	Aggregate	Aggregate	Diesel	20,251.292	0.001	0.006	0.004	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Other Harvesters	Aggregate	Aggregate	Diesel	30,376.555	0.001	0.007	0.005	0.000	0.000	0.000
Contra Costa	2019	Agricultural - Sprayers/Spray Rigs	Aggregate	Aggregate	Diesel	41,548.475	0.002	0.012	0.008	0.000	0.001	0.001
Contra Costa	2019	Agricultural - Swathers/Windrowers/Hay Conditioners	Aggregate	Aggregate	Diesel	7,975.782	0.000	0.002	0.001	0.000	0.000	0.000
TOTAL AGRICULTURAL OFFROAD (tons/yr)						991,760.528	0.042	0.238	0.235	0.000	0.014	0.013
ESTIMATED Unincorporated Contra Costa County (tons/year)							0.028	0.161	0.159	0.000	0.009	0.009
ESTIMATED Unincorporated Contra Costa County (lbs/year)							56.8	321.3	317.5	0.4	18.8	17.3

AGRICULTURAL ACREAGE	**2019**
Farmland Acreage in Contra Costa County	173,924
Farmland Acreage in unincorporated Contra Costa County (excludes Grazing Land)	117,306
Percent in the unincorporated County	**67.4**%

Construction and Mining

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd
Contra Costa	2019	Construction and Mining - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	81,901.417	0.001	0.010	0.008	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Cranes	Aggregate	Aggregate	Diesel	194,908.423	0.005	0.056	0.032	0.000	0.003	0.002
Contra Costa	2019	Construction and Mining - Crawler Tractors	Aggregate	Aggregate	Diesel	481,723.300	0.012	0.129	0.068	0.000	0.006	0.006
Contra Costa	2019	Construction and Mining - Excavators	Aggregate	Aggregate	Diesel	866,786.580	0.011	0.118	0.096	0.000	0.005	0.005
Contra Costa	2019	Construction and Mining - Graders	Aggregate	Aggregate	Diesel	326,083.726	0.009	0.096	0.041	0.000	0.004	0.004
Contra Costa	2019	Construction and Mining - Misc - Asphalt Pavers	Aggregate	Aggregate	Gasoline	5,011.175	0.000	0.001	0.018	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Gasoline	3,783.827	0.000	0.000	0.005	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	29.079	0.000	0.001	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Gasoline	7,415.464	0.004	0.002	0.117	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Diesel	42.381	0.000	0.001	0.001	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Gasoline	16,131.027	0.003	0.003	0.111	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Diesel	1,417.242	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Cranes	Aggregate	Aggregate	Gasoline	3,420.050	0.000	0.000	0.006	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Crushing/Proc. Equipment	Aggregate	Aggregate	Gasoline	44.119	0.000	0.000	0.001	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Gasoline	5,644.449	0.001	0.001	0.048	0.000	0.001	0.000
Contra Costa	2019	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Diesel	3.394	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Excavators	Aggregate	Aggregate	Diesel	24.291	0.000	0.001	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Other	Aggregate	Aggregate	Gasoline	5,186.650	0.000	0.000	0.004	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Other	Aggregate	Aggregate	Diesel	6,506.415	0.000	0.003	0.002	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Pavers	Aggregate	Aggregate	Diesel	6.373	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Gasoline	16,171.089	0.007	0.005	0.201	0.000	0.002	0.002
Contra Costa	2019	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Diesel	10.849	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Gasoline	37,749.934	0.010	0.007	0.324	0.000	0.003	0.002
Contra Costa	2019	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Diesel	1,924.664	0.000	0.001	0.001	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Gasoline	15,381.507	0.002	0.002	0.069	0.000	0.001	0.000
Contra Costa	2019	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Diesel	186.465	0.001	0.003	0.002	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Rough Terrain Forklifts	Aggregate	Aggregate	Gasoline	24,119.200	0.001	0.003	0.031	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Gasoline	12,738.500	0.000	0.001	0.019	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	3.958	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Gasoline	1,145.405	0.000	0.000	0.010	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Diesel	30,728.813	0.002	0.014	0.012	0.000	0.001	0.000
Contra Costa	2019	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Gasoline	38,112.542	0.003	0.003	0.103	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1,283.012	0.004	0.027	0.015	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Surfacing Equipment	Aggregate	Aggregate	Gasoline	5,921.492	0.004	0.003	0.093	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Tampers/Rammers	Aggregate	Aggregate	Gasoline	6,793.058	0.001	0.001	0.057	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Gasoline	8,176.000	0.000	0.000	0.012	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	115.746	0.000	0.002	0.001	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Gasoline	28,545.023	0.003	0.004	0.132	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Diesel	156.568	0.000	0.003	0.002	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Off-Highway Tractors	Aggregate	Aggregate	Diesel	183,253.256	0.004	0.032	0.026	0.000	0.002	0.002
Contra Costa	2019	Construction and Mining - Off-Highway Trucks	Aggregate	Aggregate	Diesel	1,099,345.885	0.019	0.209	0.106	0.000	0.007	0.007
Contra Costa	2019	Construction and Mining - Other	Aggregate	Aggregate	Diesel	245,374.907	0.005	0.051	0.032	0.000	0.003	0.002
Contra Costa	2019	Construction and Mining - Pavers	Aggregate	Aggregate	Diesel	57,796.645	0.001	0.012	0.009	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Paving Equipment	Aggregate	Aggregate	Diesel	33,624.852	0.001	0.006	0.005	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Rollers	Aggregate	Aggregate	Diesel	149,852.204	0.004	0.031	0.029	0.000	0.002	0.002
Contra Costa	2019	Construction and Mining - Rough Terrain Forklifts	Aggregate	Aggregate	Diesel	162,677.987	0.002	0.024	0.030	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Rubber Tired Dozers	Aggregate	Aggregate	Diesel	96,167.373	0.003	0.035	0.024	0.000	0.002	0.002
Contra Costa	2019	Construction and Mining - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	1,321,485.960	0.027	0.288	0.164	0.000	0.013	0.012
Contra Costa	2019	Construction and Mining - Scrapers	Aggregate	Aggregate	Diesel	860,698.145	0.018	0.213	0.126	0.000	0.009	0.008
Contra Costa	2019	Construction and Mining - Skid Steer Loaders	Aggregate	Aggregate	Diesel	157,579.978	0.002	0.025	0.030	0.000	0.001	0.001
Contra Costa	2019	Construction and Mining - Surfacing Equipment	Aggregate	Aggregate	Diesel	18,084.284	0.000	0.003	0.002	0.000	0.000	0.000
Contra Costa	2019	Construction and Mining - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	1,204,115.588	0.024	0.242	0.222	0.000	0.014	0.013
Contra Costa	2019	Construction and Mining - Trenchers	Aggregate	Aggregate	Diesel	49,764.313	0.002	0.013	0.010	0.000	0.001	0.001

TOTAL CONSTRUCTION OFFROAD (tons/yr)	7,875,154.583	0.199	1.686	2.454	0.002	0.089	0.079
ESTIMATED Unincorporated Contra Costa County (tons/year)		0.019	0.161	0.235	0.000	0.008	0.008
ESTIMATED Unincorporated Contra Costa (lbs/year)		38.0	322.8	469.7	0.4	17.0	15.1

TOTAL UNITS: https://socds.huduser.gov/permits/	2015	2016	2017	2018	2019	Average
Housing Permits in Contra Costa County	2610	2921	1,984	2,607	2,687	2,562
Housing Permits in the Unincorporated Contra Costa County	438	270	284	95	104	238
Percent in the Unincorporated County	17%	9%	14%	4%	4%	**9.6%**

Industrial and Light Commercial

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd
Contra Costa	2019	Industrial - Aerial Lifts	Aggregate	Aggregate	Diesel	40,739.806	0.000	0.005	0.007	0.000	0.000	0.000
Contra Costa	2019	Industrial - Forklifts	Aggregate	Aggregate	Diesel	171,531.023	0.005	0.044	0.037	0.000	0.003	0.003
Contra Costa	2019	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Gasoline	27,350.160	0.003	0.002	0.087	0.000	0.001	0.001
Contra Costa	2019	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Diesel	50.830	0.000	0.001	0.001	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Electric	680.230	0.000	0.000	0.012	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Nat Gas	6,197.700	0.000	0.000	0.016	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Forklifts	Aggregate	Aggregate	Gasoline	849,275.406	0.019	0.086	2.081	0.000	0.001	0.001
Contra Costa	2019	Industrial - Misc - Forklifts	Aggregate	Aggregate	Electric	75.221	0.000	0.000	0.001	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Forklifts	Aggregate	Aggregate	Nat Gas	1,686,500.750	0.000	0.134	1.236	0.000	0.003	0.000
Contra Costa	2019	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Gasoline	14,998.942	0.001	0.001	0.083	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	39.324	0.000	0.001	0.000	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Other Material Handling Equipment	Aggregate	Aggregate	Gasoline	6,365.600	0.000	0.001	0.007	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Gasoline	48,600.070	0.001	0.004	0.116	0.000	0.000	0.000
Contra Costa	2019	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	10.074	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Industrial - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	82,844.563	0.002	0.017	0.015	0.000	0.001	0.001
Contra Costa	2019	Industrial - Other Material Handling Equipment	Aggregate	Aggregate	Diesel	48,571.971	0.001	0.010	0.007	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Gasoline	1,112,785.886	0.137	0.085	7.311	0.000	0.001	0.001
Contra Costa	2019	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Diesel	27,665.687	0.001	0.007	0.007	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Gas Compressors	Aggregate	Aggregate	Nat Gas	334,624.700	0.000	0.019	0.223	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Gasoline	1,799,298.008	0.394	0.152	10.681	0.000	0.002	0.002
Contra Costa	2019	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Diesel	151,301.596	0.005	0.035	0.028	0.000	0.001	0.002
Contra Costa	2019	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Nat Gas	10,760.200	0.000	0.001	0.006	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Gasoline	786,217.814	0.099	0.045	5.370	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Diesel	800.157	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Gasoline	231,905.284	0.031	0.016	1.070	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Diesel	82,584.476	0.003	0.019	0.016	0.000	0.001	0.001
Contra Costa	2019	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Welders	Aggregate	Aggregate	Gasoline	488,565.970	0.068	0.033	3.147	0.000	0.000	0.000
Contra Costa	2019	Light Commercial - Misc - Welders	Aggregate	Aggregate	Diesel	150,267.006	0.006	0.035	0.034	0.000	0.002	0.002
Contra Costa	2019	Light Commercial - Misc - Welders	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL LIGHT COMMERCIAL + INDUSTRIAL OFFROAD (tons/yr)						8,160,608.454	0.777	0.752	31.598	0.002	0.017	0.015
ESTIMATED Unincorporated Contra Costa County (tons/year)							0.077	0.075	3.150	0.000	0.002	0.001
ESTIMATED Unincorporated Contra Costa (lbs/year)							154.87	149.99	6,299.67	0.32	3.47	2.91

EMPLOYMENT	**2019**
Employment in Contra Costa County	388,796
Employment in Unincorporated Contra Costa County	38,757
Percent in the unincorporated County	**10.0%**

Lawn and Garden

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd
Contra Costa	2019	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Gasoline	303,129.698	0.380	0.011	1.024	0.000	0.005	0.003
Contra Costa	2019	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Gasoline	178,035.748	0.330	0.010	0.552	0.000	0.002	0.002
Contra Costa	2019	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Gasoline	3,056.980	0.000	0.000	0.020	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Diesel	193.196	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Gasoline	717,684.957	0.115	0.058	4.108	0.000	0.003	0.003
Contra Costa	2019	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Gasoline	786,503.248	0.627	0.020	2.812	0.000	0.008	0.006
Contra Costa	2019	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Gasoline	14,647.182	0.002	0.001	0.093	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Diesel	96.904	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Gasoline	1,350,073.976	0.230	0.103	9.284	0.000	0.002	0.001
Contra Costa	2019	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Diesel	77,634.324	0.003	0.018	0.011	0.000	0.001	0.000
Contra Costa	2019	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Gasoline	497.356	0.000	0.000	0.004	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Gasoline	13,731.922	0.005	0.001	0.076	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Gasoline	594,440.686	0.403	0.022	2.172	0.000	0.003	0.002
Contra Costa	2019	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Electric	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contra Costa	2019	Lawn and Garden - Misc - Wood Splitters	Aggregate	Aggregate	Gasoline	126,998.940	0.024	0.009	0.804	0.000	0.000	0.000
TOTAL LAWN & GARDEN (tons/yr)						4,166,725.117	2.119	0.253	20.958	0.001	0.024	0.018
ESTIMATED Unincorporated Contra Costa County (tons/year)							0.309	0.037	3.055	0.000	0.004	0.003
ESTIMATED Unincorporated Contra Costa (lbs/day)							618	74	6,111	0	7	5

HOUSING UNITS	**2019**
Housing Units in Contra Costa County (2019)	413,719
Housing Units in unincorporated Contra Costa County	60,315
Percent in the unincorporated county	**14.6%**

Contra Costa County VMT

Source: Fehr and Peers 2023. Based on the County of Contra Costa Transportation Analysis Guidelines.

	Daily VMT			Total Daily VMT	Total with RTAC	Percent Fleet VMT	Residents	Jobs	Service Population	VMT/SP	VMT/SP w RTAC
	IX	XI	II								
Existing - TOTAL	3,256,431	3,212,745	295,609	6,764,785	3,530,197		174,145	38,757	212,902	31.8	16.6
Passenger Vehicles	3,198,500	3,156,803	293,655	6,648,959	3,471,307	98%					
LHDT	40,753	39,075	1,562	81,390	41,476	1.2%					
MHDT	3,220	3,103	154	6,476	3,315	0.1%					
HHDT	13,958	13,764	238	27,960	14,099	0.4%					
2045	3,889,245	3,826,897	414,135	8,130,277	4,272,206		239,718	48,153	287,871	28.2	14.8
Passenger Vehicles	3,810,521	3,758,120	411,335	7,979,977	4,195,656	98%					
LHDT	55,028	48,113	2,209	105,350	53,780	1.3%					
MHDT	4,527	3,814	227	8,567	4,397	0.1%					
HHDT	19,170	16,850	363	36,383	18,373	0.4%					

Notes: Total may not add to 100% due to rounding.

IX = Internal-External

XI = External- Internal

II = Internal-Internal

Modeling of vehicle miles traveled (VMT) is provided by Fehr and Peers is based on the Contra Costa County Transportation Authority's Contra Costa Transportation Analysis Guidelines. VMT from passenger vehicles and trucks that have an origin or destination in the County using a transportation origin-destination methodology. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375). For accounting purposes, there are three types of trips:

- Vehicle trips that originated and terminated within the County (Internal-Internal, I-I). Using the accounting rules established by RTAC, 100 percent of the length of these trips, and their emissions, are attributed to the County.
- Vehicle trips that either originated or terminated (but not both) within the County (Internal-External or External-Internal, I-X and X-I). Using the accounting rules established by RTAC, 50 percent of the trip length for these trips is attributed to the
- Vehicle trips that neither originated nor terminated within the County. These trips are commonly called pass-through trips (External-External, X-X). Using the accounting rules established by RTAC, these trips are not counted towards the County's

Percent VMT from Housing assumes trip lengths for residential and non-residential land uses are similar.

Contra Costa — TRANSPORTATION SECTOR

Source: EMFAC2021 V. 1.0.2. , Web Database - Emissions Rates. Contra Costa County. Based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) Global Warming Potentials (GWPs)

Note: MTons = metric tons; CO_2e = carbon dioxide-equivalent.

Criteria Air Pollutant Emissions

	lbs/day					
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Existing	234	1,193	9,689	27	151	57
Existing in year 2045	47	201	3,722	18	136	44
2045	57	247	4,502	22	164	53
Change from Existing Conditions (2019-2045)	-176	-946	-5,188	-5	13	-4
Change from Existing Land Uses (2045 Emission Rates)	-10	-46	-780	-4	-28	-9

	Tons/year					
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Existing	41	207	1,681	5	26	10
Existing in year 2045	8	35	646	3	24	8
2045	10	43	781	4	28	9
Change from Existing Conditions (2019-2045)	-31	-164	-900	-1	2	-1
Change from Existing Land Uses (2045 Emission Rates)	-2	-8	-135	-1	-5	-2

lbs to Tons 2000

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

Year 2019 Existing: Criteria Air Pollutants

Source: EMFAC2021 (v1.0.2) Emission Rates, Contra Costa County, Average Speed, Average Fleet

Source: F&P 2023	Small Trucks	Medium Trucks	Heavy Trucks	Passenger Vehicles
Truck Trip Percentage	1.2%	0.1%	0.4%	98.3%
EMFAC Default	3.66%	1.00%	2.63%	92.71%

Daily VMT	**3,530,197**	**lbs/day**

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.02%	0.00%	0.19	1.86	0.46	0.00	0.08	0.07
All Other Buses	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
LDA	Gasoline	48.63%	51.58%	68.99	315.11	4,141.18	11.91	67.14	23.64
LDA	Diesel	0.22%	0.23%	0.60	5.87	6.58	0.04	0.66	0.45
LDA	Electricity	1.15%	1.22%	0.00	0.00	0.00	0.00	1.18	0.34
LDA	Plug-in Hybrid	0.83%	0.88%	0.10	0.24	15.57	0.10	0.87	0.29
LDT1	Gasoline	5.00%	5.30%	19.68	88.23	863.65	1.43	7.92	3.02
LDT1	Diesel	0.00%	0.00%	0.04	0.20	0.24	0.00	0.03	0.03
LDT1	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
LDT1	Plug-in Hybrid	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	21.94%	23.27%	34.17	224.61	2,093.94	6.79	32.53	11.50
LDT2	Diesel	0.09%	0.10%	0.12	0.56	1.00	0.02	0.18	0.09
LDT2	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.03%	0.04%	0.00	0.01	0.62	0.00	0.04	0.01
LHD1	Gasoline	1.79%	0.57%	3.06	13.36	68.61	0.42	3.94	1.39
LHD1	Diesel	1.22%	0.39%	7.52	86.51	22.30	0.19	4.46	2.56
LHD2	Gasoline	0.20%	0.06%	0.30	1.45	7.02	0.05	0.51	0.18
LHD2	Diesel	0.45%	0.14%	2.37	22.91	6.40	0.08	1.69	0.90
MCY	Gasoline	0.41%	0.43%	48.53	23.75	561.17	0.06	0.60	0.23
MDV	Gasoline	14.08%	14.94%	41.66	244.37	1,846.10	5.29	21.35	7.64
MDV	Diesel	0.25%	0.27%	0.28	1.94	4.20	0.09	0.49	0.24
MDV	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.05%	0.06%	0.01	0.02	1.00	0.01	0.06	0.02
MH	Gasoline	0.08%	0.01%	0.11	0.52	2.93	0.02	0.05	0.02
MH	Diesel	0.03%	0.00%	0.04	1.66	0.15	0.00	0.06	0.05
Motor Coach	Diesel	0.01%	0.00%	0.03	0.69	0.10	0.00	0.03	0.02
OBUS	Gasoline	0.06%	0.01%	0.08	0.57	1.82	0.01	0.04	0.01
PTO	Diesel	0.05%	0.01%	0.28	4.36	1.04	0.01	0.11	0.10
SBUS	Gasoline	0.01%	0.00%	0.08	0.14	1.71	0.00	0.01	0.00
SBUS	Diesel	0.04%	0.01%	0.02	1.65	0.07	0.00	0.03	0.02
SBUS	Natural Gas	0.00%	0.00%	0.00	0.01	0.28	0.00	0.00	0.00
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.01%	0.00%	0.01	0.15	0.02	0.00	0.01	0.01
T6 Instate Delivery Class 4	Diesel	0.03%	0.00%	0.14	1.77	0.37	0.00	0.07	0.06
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.03%	0.00%	0.06	0.80	0.15	0.00	0.03	0.02
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.06%	0.01%	0.19	2.47	0.50	0.01	0.10	0.08
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.01%	0.00%	0.03	0.50	0.09	0.00	0.02	0.02
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	0.10%	0.01%	0.35	5.39	0.98	0.01	0.22	0.19
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.22%	0.02%	0.28	4.67	0.83	0.02	0.24	0.17
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.17%	0.02%	0.37	5.82	1.06	0.01	0.26	0.20
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.11%	0.01%	0.19	3.36	0.54	0.01	0.15	0.11
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.01	0.10	0.02	0.00	0.01	0.00
T6 Instate Tractor Class 7	Diesel	0.02%	0.00%	0.02	0.48	0.05	0.00	0.01	0.01

T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.01%	0.00%	0.00	0.10	0.01	0.00	0.01	0.00
T6 Public Class 4	Diesel	0.01%	0.00%	0.01	0.63	0.02	0.00	0.01	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.02%	0.00%	0.01	0.49	0.02	0.00	0.01	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.02%	0.00%	0.01	0.98	0.03	0.00	0.01	0.01
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.03%	0.00%	0.03	2.27	0.07	0.00	0.03	0.02
T6 Public Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Utility Class 5	Diesel	0.01%	0.00%	0.00	0.09	0.01	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.14%	0.01%	0.26	1.35	5.88	0.02	0.06	0.02
T7 CAIRP Class 8	Diesel	0.45%	0.07%	0.47	19.11	1.73	0.08	0.96	0.53
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T7 NNOOS Class 8	Diesel	0.54%	0.08%	0.92	24.43	3.63	0.10	1.42	0.90
T7 NOOS Class 8	Diesel	0.20%	0.03%	0.24	8.64	0.87	0.03	0.43	0.25
T7 Other Port Class 8	Diesel	0.04%	0.01%	0.05	1.95	0.17	0.01	0.07	0.03
T7 POAK Class 8	Diesel	0.14%	0.02%	0.24	8.12	0.77	0.03	0.28	0.13
T7 POAK Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T7 Public Class 8	Diesel	0.07%	0.01%	0.15	11.04	0.48	0.02	0.21	0.11
T7 Public Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Diesel	0.02%	0.00%	0.04	1.00	0.15	0.00	0.06	0.04
T7 Single Concrete/Transit Mix Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.09	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	0.12%	0.02%	0.28	7.33	1.06	0.02	0.35	0.23
T7 Single Dump Class 8	Natural Gas	0.01%	0.00%	0.00	0.03	0.52	0.00	0.01	0.00
T7 Single Other Class 8	Diesel	0.11%	0.02%	0.32	7.33	1.20	0.02	0.38	0.26
T7 Single Other Class 8	Natural Gas	0.01%	0.00%	0.00	0.03	0.45	0.00	0.01	0.00
T7 SWCV Class 8	Diesel	0.05%	0.01%	0.02	5.44	0.05	0.02	0.16	0.06
T7 SWCV Class 8	Natural Gas	0.04%	0.01%	0.06	1.27	12.01	0.00	0.12	0.04
T7 Tractor Class 8	Diesel	0.39%	0.06%	0.68	22.30	2.46	0.07	0.95	0.56
T7 Tractor Class 8	Natural Gas	0.03%	0.00%	0.01	0.21	3.70	0.00	0.04	0.01
T7 Utility Class 8	Diesel	0.01%	0.00%	0.00	0.22	0.02	0.00	0.01	0.00
T7IS	Gasoline	0.00%	0.00%	0.02	0.06	0.62	0.00	0.00	0.00
UBUS	Gasoline	0.02%	0.00%	0.00	0.02	0.10	0.00	0.03	0.01
UBUS	Diesel	0.09%	0.01%	0.12	2.16	0.16	0.01	0.16	0.06
UBUS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	100.00%	100.00%	234	1,193	9,689	27	151	57

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: Contra Costa
Calendar Year: 2019
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

		g/mile																	
Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	VMT Total	% of VMT
All Other Buses	Diesel	7.83E-01	7.62E+00	1.90E+00	1.20E-02	2.88E-01	1.20E-02	4.61E-02	3.47E-01	2.76E-01	3.00E-03	1.61E-02	2.95E-01	1.27E+03	3.64E-02	2.00E-01	5,401	0.02%
All Other Buses	Natural Gas	1.04E-02	3.00E-01	3.09E+00	0.00E+00	5.82E-04	1.20E-02	4.61E-02	5.87E-02	5.35E-04	3.00E-03	1.61E-02	1.97E-02	1.09E+03	7.29E-01	2.21E-01	92	0.00%
LDA	Gasoline	1.72E-02	7.85E-02	1.03E+00	2.97E-03	1.46E-03	8.00E-03	7.26E-03	1.67E-02	1.35E-03	2.00E-03	2.54E-03	5.89E-03	3.00E+02	4.07E-03	6.89E-03	12,708,469	48.63%
LDA	Diesel	3.32E-02	3.24E-01	3.63E-01	2.30E-03	2.12E-02	8.00E-03	7.27E-03	3.65E-02	2.03E-02	2.00E-03	2.55E-03	2.48E-02	2.43E+02	1.54E-03	3.83E-02	57,342	0.22%
LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.36E-03	1.24E-02	0.00E+00	2.00E-03	1.53E-03	3.53E-03	0.00E+00	0.00E+00	0.00E+00	301,373	1.15%
LDA	Plug-in Hybrid	1.46E-03	3.46E-03	2.26E-01	1.46E-03	9.14E-04	8.00E-03	3.79E-03	1.27E-02	8.41E-04	2.00E-03	1.33E-03	4.17E-03	1.47E+02	4.66E-04	6.39E-04	217,659	0.83%
LDT1	Gasoline	4.77E-02	2.14E-01	2.09E+00	3.48E-03	2.45E-03	8.00E-03	8.74E-03	1.92E-02	2.25E-03	2.00E-03	3.06E-03	7.31E-03	3.51E+02	1.03E-02	1.43E-02	1,306,567	5.00%
LDT1	Diesel	3.08E-01	1.59E+00	1.93E+00	3.96E-03	2.32E-01	8.00E-03	1.01E-02	2.50E-01	2.22E-01	2.00E-03	3.54E-03	2.27E-01	4.18E+02	1.43E-02	6.58E-02	399	0.00%
LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.39E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00	1,597	0.01%
LDT1	Plug-in Hybrid	1.47E-03	3.47E-03	2.27E-01	1.46E-03	1.07E-03	8.00E-03	3.78E-03	1.28E-02	9.80E-04	2.00E-03	1.32E-03	4.30E-03	1.48E+02	4.71E-04	6.50E-04	19	0.00%
LDT2	Gasoline	1.89E-02	1.24E-01	1.16E+00	3.75E-03	1.51E-03	8.00E-03	8.45E-03	1.80E-02	1.39E-03	2.00E-03	2.96E-03	6.35E-03	3.79E+02	4.47E-03	8.97E-03	5,733,691	21.94%
LDT2	Diesel	1.54E-02	7.50E-02	1.34E-01	3.19E-03	7.25E-03	8.00E-03	8.19E-03	2.34E-02	6.94E-03	2.00E-03	2.86E-03	1.18E-02	3.37E+02	7.17E-04	5.31E-02	23,795	0.09%
LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.35E-03	1.24E-02	0.00E+00	2.00E-03	1.52E-03	3.52E-03	0.00E+00	0.00E+00	0.00E+00	825	0.00%
LDT2	Plug-in Hybrid	1.44E-03	3.41E-03	2.23E-01	1.44E-03	1.04E-03	8.00E-03	3.79E-03	1.28E-02	9.52E-04	2.00E-03	1.33E-03	4.28E-03	1.45E+02	4.64E-04	6.42E-04	8,729	0.03%
LHD1	Gasoline	6.84E-02	2.99E-01	1.53E+00	9.47E-03	2.05E-03	8.00E-03	7.80E-02	8.80E-02	1.89E-03	2.00E-03	2.73E-02	3.12E-02	9.57E+02	1.34E-02	1.66E-02	467,246	1.79%
LHD1	Diesel	2.47E-01	2.84E+00	7.32E-01	6.12E-03	5.63E-02	1.20E-02	7.80E-02	1.46E-01	5.38E-02	3.00E-03	2.73E-02	8.41E-02	6.46E+02	1.15E-02	1.02E-01	318,262	1.22%
LHD2	Gasoline	6.01E-02	2.88E-01	1.39E+00	1.06E-02	1.87E-03	8.00E-03	9.10E-02	1.01E-01	1.72E-03	2.00E-03	3.19E-02	3.56E-02	1.07E+03	1.22E-02	1.62E-02	52,570	0.20%
LHD2	Diesel	2.12E-01	2.04E+00	5.71E-01	7.52E-03	4.74E-02	1.20E-02	9.10E-02	1.50E-01	4.54E-02	3.00E-03	3.19E-02	8.02E-02	7.94E+02	9.83E-03	1.25E-01	117,069	0.45%
MCY	Gasoline	1.45E+00	7.10E-01	1.68E+01	1.92E-03	1.91E-03	4.00E-03	1.20E-02	1.79E-02	1.80E-03	1.00E-03	4.20E-03	7.00E-03	1.94E+02	2.07E-01	4.55E-02	105,968	0.41%
MDV	Gasoline	3.58E-02	2.10E-01	1.59E+00	4.55E-03	1.65E-03	8.00E-03	8.71E-03	1.84E-02	1.52E-03	2.00E-03	3.05E-03	6.57E-03	4.59E+02	7.54E-03	1.33E-02	3,680,635	14.08%
MDV	Diesel	1.34E-02	9.24E-02	2.00E-01	4.12E-03	7.06E-03	8.00E-03	8.20E-03	2.33E-02	6.75E-03	2.00E-03	2.87E-03	1.16E-02	4.35E+02	6.23E-04	6.85E-02	66,483	0.25%
MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.43E-03	1.24E-02	0.00E+00	2.00E-03	1.55E-03	3.55E-03	0.00E+00	0.00E+00	0.00E+00	40	0.00%
MDV	Plug-in Hybrid	1.46E-03	3.46E-03	2.27E-01	1.46E-03	1.07E-03	8.00E-03	3.78E-03	1.28E-02	9.82E-04	2.00E-03	1.32E-03	4.31E-03	1.48E+02	4.70E-04	6.48E-04	13,902	0.05%
MH	Gasoline	1.23E-01	5.78E-01	3.28E+00	1.93E-02	2.15E-03	1.20E-02	4.50E-02	5.92E-02	1.98E-03	3.00E-03	1.58E-02	2.07E-02	1.95E+03	2.43E-02	3.24E-02	19,766	0.08%
MH	Diesel	1.31E-01	4.90E+00	4.52E-01	1.02E-02	1.31E-01	1.60E-02	4.48E-02	1.91E-01	1.25E-01	4.00E-03	1.57E-02	1.45E-01	1.08E+03	6.10E-03	1.70E-01	7,504	0.03%
Motor Coach	Diesel	1.77E-01	4.33E+00	6.23E-01	1.66E-02	1.08E-01	1.20E-02	7.91E-02	1.99E-01	1.03E-01	3.00E-03	2.77E-02	1.34E-01	1.76E+03	8.24E-03	2.77E-01	3,505	0.01%
OBUS	Gasoline	1.20E-01	8.70E-01	2.76E+00	1.84E-02	7.69E-04	1.20E-02	4.48E-02	5.76E-02	7.07E-04	3.00E-03	1.57E-02	1.94E-02	1.85E+03	2.47E-02	3.94E-02	14,573	0.06%
PTO	Diesel	4.50E-01	7.06E+00	1.68E+00	2.08E-02	1.75E-01	0.00E+00	0.00E+00	1.75E-01	1.68E-01	0.00E+00	0.00E+00	1.68E-01	2.20E+03	2.09E-02	3.46E-01	13,666	0.05%
SBUS	Gasoline	4.71E-01	8.54E-01	1.05E+01	8.23E-03	3.40E-03	8.00E-03	4.49E-02	5.63E-02	3.16E-03	2.00E-03	1.57E-02	2.09E-02	8.31E+02	7.41E-02	3.99E-02	3,602	0.01%
SBUS	Diesel	5.31E-02	3.64E+00	1.64E-01	1.08E-02	2.02E-02	1.20E-02	4.49E-02	7.72E-02	1.94E-02	3.00E-03	1.57E-02	3.81E-02	1.14E+03	2.47E-03	1.80E-01	10,026	0.04%
SBUS	Natural Gas	5.20E-02	6.41E-01	1.26E+01	0.00E+00	3.67E-03	1.20E-02	4.49E-02	6.06E-02	3.38E-03	3.00E-03	1.57E-02	2.21E-02	1.31E+03	3.64E+00	2.66E-01	491	0.00%
T6 CAIRP Class 4	Diesel	8.78E-02	2.18E+00	3.12E-01	1.08E-02	7.44E-02	1.20E-02	4.23E-02	1.29E-01	7.12E-02	3.00E-03	1.48E-02	8.90E-02	1.14E+03	4.08E-03	1.79E-01	103	0.00%
T6 CAIRP Class 5	Diesel	5.99E-02	1.64E+00	2.28E-01	1.07E-02	5.44E-02	1.20E-02	4.23E-02	1.09E-01	5.21E-02	3.00E-03	1.48E-02	6.99E-02	1.13E+03	2.78E-03	1.78E-01	141	0.00%
T6 CAIRP Class 6	Diesel	8.56E-02	2.14E+00	3.18E-01	1.06E-02	7.67E-02	1.20E-02	4.23E-02	1.31E-01	7.34E-02	3.00E-03	1.48E-02	9.12E-02	1.12E+03	3.97E-03	1.76E-01	369	0.00%
T6 CAIRP Class 7	Diesel	8.48E-02	2.28E+00	2.89E-01	9.99E-03	6.94E-02	1.20E-02	4.23E-02	1.24E-01	6.64E-02	3.00E-03	1.48E-02	8.42E-02	1.06E+03	3.94E-03	1.66E-01	2,313	0.01%
T6 Instate Delivery Class 4	Diesel	5.67E-01	7.12E+00	1.49E+00	1.19E-02	2.29E-01	1.20E-02	4.76E-02	2.89E-01	2.20E-01	3.00E-03	1.66E-02	2.39E-01	1.26E+03	2.63E-02	1.98E-01	8,874	0.03%
T6 Instate Delivery Class 4	Natural Gas	1.04E-02	2.97E-01	3.25E+00	0.00E+00	6.54E-04	1.20E-02	4.76E-02	6.02E-02	6.02E-04	3.00E-03	1.66E-02	2.02E-02	1.11E+03	7.28E-01	2.27E-01	28	0.00%
T6 Instate Delivery Class 5	Diesel	2.80E-01	3.98E+00	7.42E-01	1.17E-02	1.08E-01	1.20E-02	4.76E-02	1.68E-01	1.03E-01	3.00E-03	1.66E-02	1.23E-01	1.24E+03	1.30E-02	1.95E-01	7,209	0.03%
T6 Instate Delivery Class 5	Natural Gas	1.04E-02	3.00E-01	3.25E+00	0.00E+00	6.39E-04	1.20E-02	4.76E-02	6.02E-02	5.87E-04	3.00E-03	1.66E-02	2.02E-02	1.11E+03	7.27E-01	2.27E-01	27	0.00%
T6 Instate Delivery Class 6	Diesel	4.35E-01	5.63E+00	1.14E+00	1.17E-02	1.78E-01	1.20E-02	4.76E-02	2.37E-01	1.70E-01	3.00E-03	1.66E-02	1.90E-01	1.24E+03	2.02E-02	1.95E-01	15,676	0.06%
T6 Instate Delivery Class 6	Natural Gas	1.04E-02	2.98E-01	3.25E+00	0.00E+00	6.48E-04	1.20E-02	4.76E-02	6.02E-02	5.96E-04	3.00E-03	1.66E-02	2.02E-02	1.11E+03	7.28E-01	2.26E-01	59	0.00%
T6 Instate Delivery Class 7	Diesel	4.82E-01	6.94E+00	1.26E+00	1.18E-02	2.19E-01	1.20E-02	4.76E-02	2.79E-01	2.10E-01	3.00E-03	1.66E-02	2.29E-01	1.25E+03	2.24E-02	1.96E-01	2,563	0.01%
T6 Instate Delivery Class 7	Natural Gas	1.05E-02	2.84E-01	3.28E+00	0.00E+00	7.30E-04	1.20E-02	4.76E-02	6.03E-02	6.71E-04	3.00E-03	1.66E-02	2.03E-02	1.09E+03	7.36E-01	2.22E-01	12	0.00%
T6 Instate Other Class 4	Diesel	5.02E-01	7.70E+00	1.41E+00	1.12E-02	2.58E-01	1.20E-02	4.49E-02	3.14E-01	2.46E-01	3.00E-03	1.57E-02	2.65E-01	1.19E+03	2.33E-02	1.87E-01	25,076	0.10%
T6 Instate Other Class 4	Natural Gas	7.97E-03	2.28E-01	2.83E+00	0.00E+00	5.11E-04	1.20E-02	4.49E-02	5.74E-02	4.69E-04	3.00E-03	1.57E-02	1.92E-02	9.65E+02	5.58E-01	1.97E-01	51	0.00%
T6 Instate Other Class 5	Diesel	1.68E-01	2.84E+00	5.08E-01	1.10E-02	8.85E-02	1.20E-02	4.49E-02	1.45E-01	8.47E-02	3.00E-03	1.57E-02	1.03E-01	1.16E+03	7.81E-03	1.83E-01	58,748	0.22%
T6 Instate Other Class 5	Natural Gas	7.93E-03	2.31E-01	2.83E+00	0.00E+00	4.93E-04	1.20E-02	4.49E-02	5.74E-02	4.54E-04	3.00E-03	1.57E-02	1.92E-02	9.64E+02	5.55E-01	1.96E-01	216	0.00%
T6 Instate Other Class 6	Diesel	2.94E-01	4.68E+00	8.53E-01	1.10E-02	1.53E-01	1.20E-02	4.49E-02	2.09E-01	1.46E-01	3.00E-03	1.57E-02	1.65E-01	1.16E+03	1.36E-02	1.82E-01	44,475	0.17%
T6 Instate Other Class 6	Natural Gas	8.01E-03	2.24E-01	2.83E+00	0.00E+00	5.35E-04	1.20E-02	4.49E-02	5.74E-02	4.92E-04	3.00E-03	1.57E-02	1.92E-02	9.66E+02	5.61E-01	1.97E-01	195	0.00%
T6 Instate Other Class 7	Diesel	2.51E-01	4.35E+00	6.99E-01	1.10E-02	1.34E-01	1.20E-02	4.49E-02	1.91E-01	1.28E-01	3.00E-03	1.57E-02	1.47E-01	1.16E+03	1.17E-02	1.83E-01	27,656	0.11%
T6 Instate Other Class 7	Natural Gas	8.72E-03	1.64E-01	2.80E+00	0.00E+00	9.07E-04	1.20E-02	4.49E-02	5.78E-02	8.34E-04	3.00E-03	1.57E-02	1.95E-02	9.36E+02	6.10E-01	1.91E-01	405	0.00%
T6 Instate Tractor Class 6	Diesel	5.67E-01	7.27E+00	1.58E+00	1.14E-02	3.33E-01	1.20E-02	4.49E-02	3.90E-01	3.19E-01	3.00E-03	1.57E-02	3.37E-01	1.21E+03	2.63E-02	1.90E-01	485	0.00%
T6 Instate Tractor Class 7	Diesel	1.65E-01	4.27E+00	4.58E-01	1.07E-02	6.85E-02	1.20E-02	4.49E-02	1.25E-01	6.56E-02	3.00E-03	1.57E-02	8.43E-02	1.13E+03	7.68E-03	1.78E-01	4,054	0.02%
T6 Instate Tractor Class 7	Natural Gas	8.54E-03	1.80E-01	2.81E+00	0.00E+00	8.12E-04	1.20E-02	4.49E-02	5.77E-02	7.47E-04	3.00E-03	1.57E-02	1.94E-02	9.36E+02	5.97E-01	1.91E-01	28	0.00%
T6 OOS Class 4	Diesel	8.78E-02	2.18E+00	3.12E-01	1.08E-02	7.44E-02	1.20E-02	4.23E-02	1.29E-01	7.12E-02	3.00E-03	1.48E-02	8.90E-02	1.14E+03	4.08E-03	1.79E-01	58	0.00%
T6 OOS Class 5	Diesel	5.99E-02	1.64E+00	2.28E-01	1.07E-02	5.44E-02	1.20E-02	4.23E-02	1.09E-01	5.21E-02	3.00E-03	1.48E-02	6.99E-02	1.13E+03	2.78E-03	1.78E-01	79	0.00%
T6 OOS Class 6	Diesel	8.56E-02	2.14E+00	3.18E-01	1.06E-02	7.67E-02	1.20E-02	4.23E-02	1.31E-01	7.34E-02	3.00E-03	1.48E-02	9.12E-02	1.12E+03	3.97E-03	1.76E-01	207	0.00%
T6 OOS Class 7	Diesel	9.39E-02	2.39E+00	3.19E-01	9.98E-03	7.66E-02	1.20E-02	4.23E-02	1.31E-01	7.33E-02	3.00E-03	1.48E-02	9.11E-02	1.05E+03	4.36E-03	1.66E-01	1,508	0.01%
T6 Public Class 4	Diesel	1.16E-01	8.19E+00	2.70E-01	1.22E-02	4.12E-02	1.20E-02	4.62E-02	9.94E-02	3.94E-02	3.00E-03	1.62E-02	5.86E-02	1.29E+03	5.37E-03	2.03E-01	2,745	0.01%
T6 Public Class 4	Natural Gas	1.10E-02	3.17E-01	3.03E+00	0.00E+00	5.68E-04	1.20E-02	4.62E-02	5.87E-02	5.23E-04	3.00E-03	1.62E-02	1.97E-02	1.07E+03	7.72E-01	2.18E-01	1	0.00%
T6 Public Class 5	Diesel	6.54E-02	3.59E+00	1.77E-01	1.18E-02	1.78E-02	1.20E-02	4.62E-02	7.59E-02	1.70E-02	3.00E-03	1.62E-02	3.62E-02	1.25E+03	3.04E-03	1.96E-01	4,833	0.02%

T6 Public Class 5	Natural Gas	1.22E-02	1.31E-01	3.08E+00	0.00E+00	1.45E-03	1.20E-02	4.62E-02	5.96E-02	1.33E-03	3.00E-03	1.62E-02	2.05E-02	1.06E+03	8.52E-01	2.16E-01	272	0.00%
T6 Public Class 6	Diesel	1.18E-01	7.79E+00	2.64E-01	1.22E-02	5.19E-02	1.20E-02	4.62E-02	1.10E-01	4.97E-02	3.00E-03	1.62E-02	6.88E-02	1.29E+03	5.50E-03	2.03E-01	4,495	0.02%
T6 Public Class 6	Natural Gas	1.19E-02	1.76E-01	3.09E+00	0.00E+00	1.24E-03	1.20E-02	4.62E-02	5.94E-02	1.14E-03	3.00E-03	1.62E-02	2.03E-02	1.05E+03	8.33E-01	2.13E-01	76	0.00%
T6 Public Class 7	Diesel	1.48E-01	9.61E+00	3.12E-01	1.24E-02	6.92E-02	1.20E-02	4.62E-02	1.27E-01	6.62E-02	3.00E-03	1.62E-02	8.54E-02	1.31E+03	6.86E-03	2.07E-01	8,450	0.03%
T6 Public Class 7	Natural Gas	1.19E-02	1.81E-01	3.10E+00	0.00E+00	1.21E-03	1.20E-02	4.62E-02	5.94E-02	1.11E-03	3.00E-03	1.62E-02	2.03E-02	1.04E+03	8.31E-01	2.12E-01	154	0.00%
T6 Utility Class 5	Diesel	2.45E-02	1.27E+00	9.54E-02	1.08E-02	6.14E-03	1.20E-02	4.55E-02	6.36E-02	5.88E-03	3.00E-03	1.59E-02	2.48E-02	1.14E+03	1.14E-03	1.79E-01	2,429	0.01%
T6 Utility Class 5	Natural Gas	9.34E-03	2.70E-01	2.89E+00	0.00E+00	5.18E-04	1.20E-02	4.55E-02	5.80E-02	4.76E-04	3.00E-03	1.59E-02	1.94E-02	1.01E+03	6.54E-01	2.06E-01	35	0.00%
T6 Utility Class 6	Diesel	3.71E-02	2.08E+00	1.24E-01	1.10E-02	1.08E-02	1.20E-02	4.55E-02	6.83E-02	1.03E-02	3.00E-03	1.59E-02	2.92E-02	1.17E+03	1.72E-03	1.83E-01	461	0.00%
T6 Utility Class 6	Natural Gas	9.34E-03	2.70E-01	2.89E+00	0.00E+00	5.18E-04	1.20E-02	4.55E-02	5.80E-02	4.76E-04	3.00E-03	1.59E-02	1.94E-02	9.95E+02	6.54E-01	2.03E-01	4	0.00%
T6 Utility Class 7	Diesel	2.80E-02	1.92E+00	1.00E-01	1.10E-02	1.03E-02	1.20E-02	4.55E-02	6.78E-02	9.87E-03	3.00E-03	1.59E-02	2.88E-02	1.17E+03	1.30E-03	1.83E-01	635	0.00%
T6 Utility Class 7	Natural Gas	9.34E-03	2.70E-01	2.89E+00	0.00E+00	5.18E-04	1.20E-02	4.55E-02	5.80E-02	4.76E-04	3.00E-03	1.59E-02	1.94E-02	1.00E+03	6.54E-01	2.04E-01	13	0.00%
T6TS	Gasoline	2.58E-01	1.33E+00	5.81E+00	1.88E-02	2.08E-03	1.20E-02	4.50E-02	5.91E-02	1.92E-03	3.00E-03	1.58E-02	2.07E-02	1.90E+03	4.74E-02	5.56E-02	36,239	0.14%
T7 CAIRP Class 8	Diesel	8.81E-02	3.58E+00	3.24E-01	1.51E-02	6.62E-02	3.60E-02	7.73E-02	1.80E-01	6.33E-02	9.00E-03	2.71E-02	9.94E-02	1.60E+03	4.09E-03	2.52E-01	118,223	0.45%
T7 CAIRP Class 8	Natural Gas	1.32E-02	2.62E-01	4.60E+00	0.00E+00	1.74E-03	3.60E-02	7.41E-02	1.12E-01	1.60E-03	9.00E-03	2.59E-02	3.65E-02	1.18E+03	9.23E-01	2.41E-01	201	0.00%
T7 NNOOS Class 8	Diesel	1.45E-01	3.84E+00	5.72E-01	1.52E-02	1.09E-01	3.60E-02	7.82E-02	2.24E-01	1.05E-01	9.00E-03	2.74E-02	1.41E-01	1.61E+03	6.74E-03	2.54E-01	140,606	0.54%
T7 NOOS Class 8	Diesel	1.03E-01	3.74E+00	3.75E-01	1.51E-02	7.38E-02	3.60E-02	7.75E-02	1.87E-01	7.06E-02	9.00E-03	2.71E-02	1.07E-01	1.60E+03	4.78E-03	2.52E-01	51,092	0.20%
T7 Other Port Class 8	Diesel	1.19E-01	4.46E+00	3.80E-01	1.63E-02	3.11E-02	3.60E-02	9.40E-02	1.61E-01	2.98E-02	9.00E-03	3.29E-02	7.17E-02	1.72E+03	5.53E-03	2.71E-01	9,668	0.04%
T7 POAK Class 8	Diesel	1.47E-01	4.97E+00	4.69E-01	1.63E-02	4.14E-02	3.60E-02	9.60E-02	1.73E-01	3.96E-02	9.00E-03	3.36E-02	8.22E-02	1.73E+03	6.85E-03	2.72E-01	36,148	0.14%
T7 POAK Class 8	Natural Gas	1.70E-02	7.05E-01	1.10E+01	0.00E+00	1.36E-03	3.60E-02	8.52E-02	1.23E-01	1.25E-03	9.00E-03	2.98E-02	4.01E-02	1.49E+03	1.19E+00	3.04E-01	79	0.00%
T7 Public Class 8	Diesel	1.73E-01	1.27E+01	5.50E-01	1.87E-02	8.30E-02	3.60E-02	1.21E-01	2.40E-01	7.94E-02	9.00E-03	4.24E-02	1.31E-01	1.98E+03	8.01E-03	3.12E-01	19,202	0.07%
T7 Public Class 8	Natural Gas	2.61E-02	7.55E-01	1.07E+01	0.00E+00	2.46E-03	3.60E-02	1.07E-01	1.45E-01	2.26E-03	9.00E-03	3.75E-02	4.87E-02	1.68E+03	1.83E+00	3.43E-01	61	0.00%
T7 Single Concrete/Transit Mix Class 8	Diesel	1.73E-01	4.05E+00	6.29E-01	1.62E-02	1.11E-01	3.60E-02	8.68E-02	2.33E-01	1.06E-01	9.00E-03	3.04E-02	1.45E-01	1.71E+03	8.02E-03	2.69E-01	5,440	0.02%
T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.51E-02	4.28E-01	7.58E+00	0.00E+00	1.68E-03	3.60E-02	8.16E-02	1.19E-01	1.54E-03	9.00E-03	2.86E-02	3.91E-02	1.28E+03	1.06E+00	2.60E-01	249	0.00%
T7 Single Dump Class 8	Diesel	2.06E-01	5.33E+00	7.69E-01	1.60E-02	1.31E-01	3.60E-02	8.91E-02	2.56E-01	1.25E-01	9.00E-03	3.12E-02	1.65E-01	1.69E+03	9.58E-03	2.67E-01	30,417	0.12%
T7 Single Dump Class 8	Natural Gas	1.51E-02	4.26E-01	7.57E+00	0.00E+00	1.68E-03	3.60E-02	8.24E-02	1.20E-01	1.54E-03	9.00E-03	2.88E-02	3.94E-02	1.32E+03	1.06E+00	2.68E-01	1,525	0.01%
T7 Single Other Class 8	Diesel	2.37E-01	5.43E+00	8.92E-01	1.61E-02	1.56E-01	3.60E-02	8.97E-02	2.82E-01	1.49E-01	9.00E-03	3.14E-02	1.90E-01	1.70E+03	1.10E-02	2.68E-01	29,887	0.11%
T7 Single Other Class 8	Natural Gas	1.51E-02	4.26E-01	7.59E+00	0.00E+00	1.68E-03	3.60E-02	8.29E-02	1.21E-01	1.54E-03	9.00E-03	2.90E-02	3.96E-02	1.31E+03	1.06E+00	2.67E-01	1,308	0.01%
T7 SWCV Class 8	Diesel	3.05E-02	8.80E+00	8.25E-02	3.90E-02	1.36E-02	3.60E-02	2.10E-01	2.60E-01	1.30E-02	9.00E-03	7.35E-02	9.55E-02	4.12E+03	1.42E-03	6.49E-01	13,676	0.05%
T7 SWCV Class 8	Natural Gas	1.30E-01	2.64E+00	2.50E+01	0.00E+00	2.74E-03	3.60E-02	2.10E-01	2.49E-01	2.52E-03	9.00E-03	7.35E-02	8.50E-02	1.72E+03	5.48E+00	3.51E-01	10,621	0.04%
T7 Tractor Class 8	Diesel	1.49E-01	4.88E+00	5.39E-01	1.51E-02	8.69E-02	3.60E-02	8.54E-02	2.08E-01	8.32E-02	9.00E-03	2.99E-02	1.22E-01	1.60E+03	6.91E-03	2.51E-01	101,106	0.39%
T7 Tractor Class 8	Natural Gas	1.42E-02	5.64E-01	9.76E+00	0.00E+00	1.24E-03	3.60E-02	7.85E-02	1.16E-01	1.14E-03	9.00E-03	2.75E-02	3.76E-02	1.22E+03	9.96E-01	2.49E-01	8,401	0.03%
T7 Utility Class 8	Diesel	4.10E-02	2.46E+00	1.98E-01	1.68E-02	1.14E-02	3.60E-02	9.84E-02	1.46E-01	1.09E-02	9.00E-03	3.44E-02	5.43E-02	1.78E+03	1.90E-03	2.80E-01	1,945	0.01%
T7IS	Gasoline	9.28E+00	2.69E+01	2.61E+02	2.92E-02	1.82E-02	2.00E-02	1.18E-01	1.56E-01	1.71E-02	5.00E-03	4.13E-02	6.34E-02	2.95E+03	1.10E+00	5.76E-01	52	0.00%
UBUS	Gasoline	1.03E-02	9.66E-02	4.08E-01	1.37E-02	1.22E-03	1.00E-02	1.01E-01	1.12E-01	1.12E-03	2.50E-03	3.52E-02	3.88E-02	1.39E+03	3.24E-03	1.03E-02	5,509	0.02%
UBUS	Diesel	1.12E-01	2.03E+00	1.53E-01	1.33E-02	7.36E-03	3.09E-02	1.10E-01	1.48E-01	7.04E-03	7.73E-03	3.85E-02	5.33E-02	1.41E+03	5.20E-03	2.21E-01	23,552	0.09%
UBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-02	5.50E-02	7.80E-02	0.00E+00	5.75E-03	1.93E-02	2.50E-02	0.00E+00	0.00E+00	0.00E+00	336	0.00%
																Total VMT	26,132,029	

lbs/Mile															
ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	
1.73E-03	1.68E-02	4.18E-03	2.65E-05	2.65E-05	1.02E-04	6.36E-04	7.64E-04	6.61E-06	3.56E-05	6.08E-04	6.51E-04	2.80E+00	8.02E-05	4.41E-04	
2.30E-05	6.62E-04	6.82E-03	0.00E+00	2.65E-05	1.02E-04	1.28E-06	1.29E-04	6.61E-06	3.56E-05	1.18E-06	4.34E-05	2.40E+00	1.61E-03	4.88E-04	
3.79E-05	1.73E-04	2.27E-03	6.54E-06	1.76E-05	1.60E-05	3.23E-06	3.69E-05	4.41E-06	5.60E-06	2.97E-06	1.30E-05	6.61E-01	8.98E-06	1.52E-05	
7.31E-05	7.14E-04	8.01E-04	5.08E-06	1.76E-05	1.60E-05	4.67E-05	8.04E-05	4.41E-06	5.61E-06	4.47E-05	5.47E-05	5.37E-01	3.39E-06	8.45E-05	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.61E-06	0.00E+00	2.72E-05	4.41E-06	3.36E-06	0.00E+00	7.77E-06	0.00E+00	0.00E+00	0.00E+00	
3.22E-06	7.63E-06	4.99E-04	3.22E-06	1.76E-05	8.35E-06	2.02E-06	2.80E-05	4.41E-06	2.92E-06	1.85E-06	9.19E-06	3.25E-01	1.03E-06	1.41E-06	
1.05E-04	4.71E-04	4.61E-03	7.66E-06	1.76E-05	1.93E-05	5.40E-06	4.23E-05	4.41E-06	6.74E-06	4.97E-06	1.61E-05	7.74E-01	2.28E-05	3.15E-05	
6.78E-04	3.50E-03	4.27E-03	8.73E-06	1.76E-05	2.23E-05	5.11E-04	5.51E-04	4.41E-06	7.81E-06	4.89E-04	5.01E-04	9.22E-01	3.15E-05	1.45E-04	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.69E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00	
3.23E-06	7.65E-06	5.01E-04	3.23E-06	1.76E-05	8.34E-06	2.35E-06	2.83E-05	4.41E-06	2.92E-06	2.16E-06	9.49E-06	3.26E-01	1.04E-06	1.43E-06	
4.16E-05	2.73E-04	2.55E-03	8.26E-06	1.76E-05	1.86E-05	3.33E-06	3.96E-05	4.41E-06	6.52E-06	3.07E-06	1.40E-05	8.35E-01	9.86E-06	1.98E-05	
3.40E-05	1.65E-04	2.95E-04	7.04E-06	1.76E-05	1.80E-05	1.60E-05	5.17E-05	4.41E-06	6.32E-06	1.53E-05	2.60E-05	7.43E-01	1.58E-06	1.17E-04	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.60E-06	0.00E+00	2.72E-05	4.41E-06	3.36E-06	0.00E+00	7.77E-06	0.00E+00	0.00E+00	0.00E+00	
3.17E-06	7.51E-06	4.92E-04	3.17E-06	1.76E-05	8.35E-06	2.28E-06	2.83E-05	4.41E-06	2.92E-06	2.10E-06	9.43E-06	3.20E-01	1.02E-06	1.42E-06	
1.51E-04	6.58E-04	3.38E-03	2.09E-05	1.76E-05	1.72E-04	4.52E-06	1.94E-04	4.41E-06	6.02E-05	4.16E-06	6.88E-05	2.11E+00	2.95E-05	3.67E-05	
5.44E-04	6.26E-03	1.61E-03	1.35E-05	2.65E-05	1.72E-04	1.24E-04	3.22E-04	6.61E-06	6.02E-05	1.19E-04	1.85E-04	1.42E+00	2.53E-05	2.24E-04	
1.32E-04	6.34E-04	3.08E-03	2.33E-05	1.76E-05	2.01E-04	4.12E-06	2.22E-04	4.41E-06	7.02E-05	3.79E-06	7.84E-05	2.36E+00	2.69E-05	3.58E-05	
4.67E-04	4.51E-03	1.26E-03	1.66E-05	2.65E-05	2.01E-04	1.05E-04	3.32E-04	6.61E-06	7.02E-05	1.00E-04	1.77E-04	1.75E+00	2.17E-05	2.76E-04	
3.20E-03	1.56E-03	3.70E-02	4.23E-06	8.82E-06	2.65E-05	4.21E-06	3.95E-05	2.20E-06	9.26E-06	3.96E-06	1.54E-05	4.27E-01	4.56E-04	1.00E-04	
7.90E-05	4.63E-04	3.50E-03	1.00E-05	1.76E-05	1.92E-05	3.64E-06	4.05E-05	4.41E-06	6.72E-06	3.35E-06	1.45E-05	1.01E+00	1.66E-05	2.93E-05	
2.96E-05	2.04E-04	4.41E-04	9.08E-06	1.76E-05	1.81E-05	1.56E-05	5.13E-05	4.41E-06	6.33E-06	1.49E-05	2.56E-05	9.59E-01	1.37E-06	1.51E-04	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.76E-06	0.00E+00	2.74E-05	4.41E-06	3.42E-06	0.00E+00	7.83E-06	0.00E+00	0.00E+00	0.00E+00	
3.22E-06	7.63E-06	5.00E-04	3.22E-06	1.76E-05	8.34E-06	2.35E-06	2.83E-05	4.41E-06	2.92E-06	2.16E-06	9.49E-06	3.25E-01	1.04E-06	1.43E-06	
2.71E-04	1.27E-03	7.24E-03	4.25E-05	2.65E-05	9.92E-05	4.74E-06	1.30E-04	6.61E-06	3.47E-05	4.37E-06	4.57E-05	4.30E+00	5.36E-05	7.15E-05	
2.90E-04	1.08E-02	9.97E-04	2.25E-05	3.53E-05	9.87E-05	2.88E-04	4.22E-04	8.82E-06	3.46E-05	2.75E-04	3.19E-04	2.38E+00	1.35E-05	3.75E-04	
3.91E-04	9.55E-03	1.37E-03	3.67E-05	2.65E-05	1.74E-04	2.38E-04	4.39E-04	6.61E-06	6.10E-05	2.27E-04	2.95E-04	3.88E+00	1.82E-05	6.10E-04	
2.65E-04	1.92E-03	6.09E-03	4.05E-05	2.65E-05	9.88E-05	1.70E-06	1.27E-04	6.61E-06	3.46E-05	1.56E-06	4.27E-05	4.09E+00	5.43E-05	8.70E-05	
9.92E-04	1.56E-02	3.71E-03	4.58E-05	0.00E+00	0.00E+00	3.87E-04	3.87E-04	0.00E+00	0.00E+00	3.70E-04	3.70E-04	4.84E+00	4.61E-05	7.62E-04	
1.04E-03	1.88E-03	2.32E-02	1.81E-05	1.76E-05	9.90E-05	7.50E-06	1.24E-04	4.41E-06	3.47E-05	6.97E-06	4.60E-05	1.83E+00	1.63E-04	8.79E-05	
1.17E-04	8.03E-03	3.61E-04	2.39E-05	2.65E-05	9.90E-05	4.46E-05	1.70E-04	6.61E-06	3.47E-05	4.27E-05	8.40E-05	2.52E+00	5.43E-06	3.97E-04	
1.15E-04	1.41E-03	2.78E-02	0.00E+00	2.65E-05	9.90E-05	8.10E-06	1.34E-04	6.61E-06	3.47E-05	7.45E-06	4.87E-05	2.88E+00	8.02E-03	5.87E-04	
1.94E-04	4.80E-03	6.87E-04	2.38E-05	2.65E-05	9.33E-05	1.64E-04	2.84E-04	6.61E-06	3.26E-05	1.57E-04	1.96E-04	2.51E+00	9.00E-06	3.96E-04	
1.32E-04	3.61E-03	5.03E-04	2.37E-05	2.65E-05	9.33E-05	1.20E-04	2.40E-04	6.61E-06	3.26E-05	1.15E-04	1.54E-04	2.50E+00	6.14E-06	3.94E-04	
1.89E-04	4.72E-03	7.01E-04	2.34E-05	2.65E-05	9.33E-05	1.69E-04	2.89E-04	6.61E-06	3.26E-05	1.62E-04	2.01E-04	2.47E+00	8.76E-06	3.89E-04	
1.87E-04	5.02E-03	6.38E-04	2.20E-05	2.65E-05	9.33E-05	1.53E-04	2.73E-04	6.61E-06	3.26E-05	1.46E-04	1.86E-04	2.33E+00	8.68E-06	3.66E-04	
1.25E-03	1.57E-02	3.28E-03	2.62E-05	2.65E-05	1.05E-04	5.06E-04	6.37E-04	6.61E-06	3.67E-05	4.84E-04	5.27E-04	2.77E+00	5.80E-05	4.36E-04	
2.29E-05	6.55E-04	7.17E-03	0.00E+00	2.65E-05	1.05E-04	1.44E-06	1.33E-04	6.61E-06	3.67E-05	1.33E-06	4.46E-05	2.45E+00	1.61E-03	5.00E-04	
6.17E-04	8.76E-03	1.63E-03	2.58E-05	2.65E-05	1.05E-04	2.38E-04	3.70E-04	6.61E-06	3.67E-05	2.28E-04	2.71E-04	2.73E+00	2.87E-05	4.30E-04	
2.29E-05	6.61E-04	7.16E-03	0.00E+00	2.65E-05	1.05E-04	1.41E-06	1.33E-04	6.61E-06	3.67E-05	1.29E-06	4.46E-05	2.45E+00	1.60E-03	5.00E-04	
9.60E-04	1.24E-02	2.52E-03	2.59E-05	2.65E-05	1.05E-04	3.92E-04	5.23E-04	6.61E-06	3.67E-05	3.75E-04	4.18E-04	2.73E+00	4.46E-05	4.30E-04	
2.29E-05	6.58E-04	7.16E-03	0.00E+00	2.65E-05	1.05E-04	1.43E-06	1.33E-04	6.61E-06	3.67E-05	1.31E-06	4.46E-05	2.45E+00	1.60E-03	4.99E-04	
1.06E-03	1.53E-02	2.77E-03	2.60E-05	2.65E-05	1.05E-04	4.83E-04	6.14E-04	6.61E-06	3.67E-05	4.62E-04	5.05E-04	2.75E+00	4.94E-05	4.33E-04	
2.32E-05	6.26E-04	7.24E-03	0.00E+00	2.65E-05	1.05E-04	1.61E-06	1.33E-04	6.61E-06	3.67E-05	1.48E-06	4.48E-05	2.40E+00	1.62E-03	4.89E-04	
1.11E-03	1.70E-02	3.10E-03	2.47E-05	2.65E-05	9.89E-05	5.68E-04	6.93E-04	6.61E-06	3.46E-05	5.43E-04	5.84E-04	2.61E+00	5.14E-05	4.11E-04	
1.76E-05	5.02E-04	6.24E-03	0.00E+00	2.65E-05	9.89E-05	1.13E-06	1.26E-04	6.61E-06	3.46E-05	1.03E-06	4.23E-05	2.13E+00	1.23E-03	4.34E-04	
3.71E-04	6.27E-03	1.12E-03	2.42E-05	2.65E-05	9.89E-05	1.95E-04	3.20E-04	6.61E-06	3.46E-05	1.87E-04	2.28E-04	2.56E+00	1.72E-05	4.03E-04	
1.75E-05	5.09E-04	6.25E-03	0.00E+00	2.65E-05	9.89E-05	1.09E-06	1.26E-04	6.61E-06	3.46E-05	1.00E-06	4.22E-05	2.12E+00	1.22E-03	4.33E-04	
6.47E-04	1.03E-02	1.88E-03	2.42E-05	2.65E-05	9.89E-05	3.36E-04	4.62E-04	6.61E-06	3.46E-05	3.22E-04	3.63E-04	2.55E+00	3.01E-05	4.02E-04	
1.77E-05	4.93E-04	6.24E-03	0.00E+00	2.65E-05	9.89E-05	1.18E-06	1.27E-04	6.61E-06	3.46E-05	1.08E-06	4.23E-05	2.13E+00	1.24E-03	4.34E-04	
5.54E-04	9.59E-03	1.54E-03	2.42E-05	2.65E-05	9.89E-05	2.96E-04	4.21E-04	6.61E-06	3.46E-05	2.83E-04	3.24E-04	2.56E+00	2.57E-05	4.03E-04	
1.92E-05	3.62E-04	6.17E-03	0.00E+00	2.65E-05	9.89E-05	2.00E-06	1.27E-04	6.61E-06	3.46E-05	1.84E-06	4.31E-05	2.06E+00	1.34E-03	4.21E-04	
1.25E-03	1.60E-02	3.49E-03	2.52E-05	2.65E-05	9.89E-05	7.34E-04	8.60E-04	6.61E-06	3.46E-05	7.03E-04	7.44E-04	2.66E+00	5.81E-05	4.19E-04	
3.65E-04	9.41E-03	1.01E-03	2.36E-05	2.65E-05	9.89E-05	1.51E-04	2.76E-04	6.61E-06	3.46E-05	1.45E-04	1.86E-04	2.49E+00	1.69E-05	3.92E-04	
1.88E-05	3.97E-04	6.19E-03	0.00E+00	2.65E-05	9.89E-05	1.79E-06	1.27E-04	6.61E-06	3.46E-05	1.65E-06	4.29E-05	2.06E+00	1.32E-03	4.21E-04	
1.94E-04	4.80E-03	6.87E-04	2.38E-05	2.65E-05	9.33E-05	1.64E-04	2.84E-04	6.61E-06	3.26E-05	1.57E-04	1.96E-04	2.51E+00	9.00E-06	3.96E-04	
1.32E-04	3.61E-03	5.03E-04	2.37E-05	2.65E-05	9.33E-05	1.20E-04	2.40E-04	6.61E-06	3.26E-05	1.15E-04	1.54E-04	2.50E+00	6.14E-06	3.94E-04	
1.89E-04	4.72E-03	7.01E-04	2.34E-05	2.65E-05	9.33E-05	1.69E-04	2.89E-04	6.61E-06	3.26E-05	1.62E-04	2.01E-04	2.47E+00	8.76E-06	3.89E-04	
2.07E-04	5.28E-03	7.04E-04	2.20E-05	2.65E-05	9.33E-05	1.69E-04	2.89E-04	6.61E-06	3.26E-05	1.62E-04	2.01E-04	2.33E+00	9.61E-06	3.66E-04	
2.55E-04	1.81E-02	5.96E-04	2.68E-05	2.65E-05	1.02E-04	9.08E-05	2.19E-04	6.61E-06	3.56E-05	8.69E-05	1.29E-04	2.84E+00	1.18E-05	4.46E-04	
2.43E-05	6.98E-04	6.68E-03	0.00E+00	2.65E-05	1.02E-04	1.25E-06	1.29E-04	6.61E-06	3.56E-05	1.15E-06	4.34E-05	2.35E+00	1.70E-03	4.80E-04	
1.44E-04	7.92E-03	3.91E-04	2.60E-05	2.65E-05	1.02E-04	3.92E-05	1.67E-04	6.61E-06	3.56E-05	3.75E-05	7.97E-05	2.75E+00	6.70E-06	4.33E-04	

1.00E-06

2.68E-05	2.90E-04	6.78E-03	0.00E+00	2.65E-05	1.02E-04	3.19E-06	1.31E-04	6.61E-06	3.56E-05	2.93E-06	4.52E-05	2.34E+00	1.88E-03	4.76E-04
2.61E-04	1.72E-02	5.82E-04	2.69E-05	2.65E-05	1.02E-04	1.14E-04	2.43E-04	6.61E-06	3.56E-05	1.10E-04	1.52E-04	2.84E+00	1.21E-05	4.47E-04
2.63E-05	3.88E-04	6.81E-03	0.00E+00	2.65E-05	1.02E-04	2.73E-06	1.31E-04	6.61E-06	3.56E-05	2.51E-06	4.47E-05	2.31E+00	1.84E-03	4.70E-04
3.26E-04	2.12E-02	6.89E-04	2.74E-05	2.65E-05	1.02E-04	1.53E-04	2.81E-04	6.61E-06	3.56E-05	1.46E-04	1.88E-04	2.89E+00	1.51E-05	4.55E-04
2.62E-05	3.99E-04	6.83E-03	0.00E+00	2.65E-05	1.02E-04	2.67E-06	1.31E-04	6.61E-06	3.56E-05	2.46E-06	4.47E-05	2.29E+00	1.83E-03	4.68E-04
5.40E-05	2.80E-03	2.10E-04	2.38E-05	2.65E-05	1.00E-04	1.35E-05	1.40E-04	6.61E-06	3.51E-05	1.30E-05	5.47E-05	2.51E+00	2.51E-06	3.95E-04
2.06E-05	5.94E-04	6.38E-03	0.00E+00	2.65E-05	1.00E-04	1.14E-06	1.28E-04	6.61E-06	3.51E-05	1.05E-06	4.28E-05	2.23E+00	1.44E-03	4.54E-04
8.18E-05	4.59E-03	2.73E-04	2.43E-05	2.65E-05	1.00E-04	2.37E-05	1.50E-04	6.61E-06	3.51E-05	2.27E-05	6.44E-05	2.57E+00	3.80E-06	4.04E-04
2.06E-05	5.94E-04	6.38E-03	0.00E+00	2.65E-05	1.00E-04	1.14E-06	1.28E-04	6.61E-06	3.51E-05	1.05E-06	4.28E-05	2.19E+00	1.44E-03	4.47E-04
6.17E-05	4.23E-03	2.21E-04	2.43E-05	2.65E-05	1.00E-04	2.27E-05	1.49E-04	6.61E-06	3.51E-05	2.17E-05	6.35E-05	2.57E+00	2.86E-06	4.04E-04
2.06E-05	5.94E-04	6.38E-03	0.00E+00	2.65E-05	1.00E-04	1.14E-06	1.28E-04	6.61E-06	3.51E-05	1.05E-06	4.28E-05	2.21E+00	1.44E-03	4.50E-04
5.70E-04	2.94E-03	1.28E-02	4.15E-05	2.65E-05	9.92E-05	4.59E-06	1.30E-04	6.61E-06	3.47E-05	4.24E-06	4.56E-05	4.20E+00	1.04E-04	1.22E-04
1.94E-04	7.89E-03	7.14E-04	3.34E-05	7.94E-05	1.70E-04	1.46E-04	3.96E-04	1.98E-05	5.97E-05	1.40E-04	2.19E-04	3.53E+00	9.02E-06	5.56E-04
2.91E-05	5.77E-04	1.01E-02	0.00E+00	7.94E-05	1.63E-04	3.83E-06	2.47E-04	1.98E-05	5.72E-05	3.52E-06	8.05E-05	2.60E+00	2.04E-03	5.31E-04
3.20E-04	8.48E-03	1.26E-03	3.36E-05	7.94E-05	1.72E-04	2.41E-04	4.93E-04	1.98E-05	6.03E-05	2.31E-04	3.11E-04	3.55E+00	1.49E-05	5.59E-04
2.27E-04	8.25E-03	8.27E-04	3.34E-05	7.94E-05	1.71E-04	1.63E-04	4.13E-04	1.98E-05	5.98E-05	1.56E-04	2.35E-04	3.53E+00	1.05E-05	5.56E-04
2.63E-04	9.84E-03	8.38E-04	3.59E-05	7.94E-05	2.07E-04	6.86E-05	3.55E-04	1.98E-05	7.26E-05	6.56E-05	1.58E-04	3.80E+00	1.22E-05	5.98E-04
3.25E-04	1.10E-02	1.03E-03	3.60E-05	7.94E-05	2.12E-04	9.13E-05	3.82E-04	1.98E-05	7.41E-05	8.73E-05	1.81E-04	3.80E+00	1.51E-05	5.99E-04
3.74E-05	1.55E-03	2.43E-02	0.00E+00	7.94E-05	1.88E-04	2.99E-06	2.70E-04	1.98E-05	6.58E-05	2.75E-06	8.84E-05	3.29E+00	2.62E-03	6.71E-04
3.80E-04	2.81E-02	1.21E-03	4.13E-05	7.94E-05	2.67E-04	1.83E-04	5.30E-04	1.98E-05	9.35E-05	1.75E-04	2.88E-04	4.37E+00	1.77E-05	6.87E-04
5.76E-05	1.67E-03	2.35E-02	0.00E+00	7.94E-05	2.36E-04	5.42E-06	3.21E-04	1.98E-05	8.26E-05	4.98E-06	1.07E-04	3.71E+00	4.03E-03	7.56E-04
3.81E-04	8.93E-03	1.39E-03	3.56E-05	7.94E-05	1.91E-04	2.44E-04	5.14E-04	1.98E-05	6.69E-05	2.33E-04	3.20E-04	3.77E+00	1.77E-05	5.93E-04
3.34E-05	9.43E-04	1.67E-02	0.00E+00	7.94E-05	1.80E-04	3.69E-06	2.63E-04	1.98E-05	6.30E-05	3.40E-06	8.62E-05	2.81E+00	2.34E-03	5.74E-04
4.55E-04	1.18E-02	1.69E-03	3.53E-05	7.94E-05	1.96E-04	2.88E-04	5.64E-04	1.98E-05	6.87E-05	2.76E-04	3.64E-04	3.74E+00	2.11E-05	5.88E-04
3.34E-05	9.39E-04	1.67E-02	0.00E+00	7.94E-05	1.82E-04	3.70E-06	2.65E-04	1.98E-05	6.36E-05	3.40E-06	8.68E-05	2.90E+00	2.34E-03	5.92E-04
5.23E-04	1.20E-02	1.97E-03	3.55E-05	7.94E-05	1.98E-04	3.44E-04	6.21E-04	1.98E-05	6.92E-05	3.29E-04	4.18E-04	3.75E+00	2.43E-05	5.91E-04
3.34E-05	9.39E-04	1.67E-02	0.00E+00	7.94E-05	1.83E-04	3.69E-06	2.66E-04	1.98E-05	6.40E-05	3.40E-06	8.72E-05	2.88E+00	2.34E-03	5.88E-04
6.73E-05	1.94E-02	1.82E-04	8.60E-05	7.94E-05	4.63E-04	3.00E-05	5.72E-04	1.98E-05	1.62E-04	2.87E-05	2.11E-04	9.09E+00	3.13E-06	1.43E-03
2.87E-04	5.83E-03	5.52E-02	0.00E+00	7.94E-05	4.63E-04	6.05E-06	5.48E-04	1.98E-05	1.62E-04	5.56E-06	1.87E-04	3.80E+00	1.21E-02	7.74E-04
3.28E-04	1.08E-02	1.19E-03	3.33E-05	7.94E-05	1.88E-04	1.92E-04	4.59E-04	1.98E-05	6.59E-05	1.83E-04	2.69E-04	3.52E+00	1.52E-05	5.54E-04
3.14E-05	1.24E-03	2.15E-02	0.00E+00	7.94E-05	1.73E-04	2.74E-06	2.55E-04	1.98E-05	6.05E-05	2.51E-06	8.29E-05	2.69E+00	2.19E-03	5.49E-04
9.04E-05	5.43E-03	4.37E-04	3.71E-05	7.94E-05	2.17E-04	2.51E-05	3.21E-04	1.98E-05	7.59E-05	2.40E-05	1.20E-04	3.92E+00	4.20E-06	6.17E-04
2.04E-02	5.92E-02	5.76E-01	6.44E-05	4.41E-05	2.60E-04	4.01E-05	3.45E-04	1.10E-05	9.11E-05	3.77E-05	1.40E-04	6.51E+00	2.44E-03	1.27E-03
2.27E-05	2.13E-04	9.00E-04	3.03E-05	2.21E-05	2.22E-04	2.70E-06	2.46E-04	5.52E-06	7.76E-05	2.48E-06	8.56E-05	3.06E+00	7.14E-06	2.27E-05
2.47E-04	4.48E-03	3.38E-04	2.93E-05	6.82E-05	2.43E-04	1.62E-05	3.27E-04	1.71E-05	8.49E-05	1.55E-05	1.17E-04	3.10E+00	1.15E-05	4.88E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.07E-05	1.21E-04	0.00E+00	1.72E-04	1.27E-05	4.24E-05	0.00E+00	5.51E-05	0.00E+00	0.00E+00	0.00E+00

MTens/Mile															
ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	
7.83E-07	7.62E-06	1.90E-06	1.20E-08	1.20E-08	4.61E-08	2.88E-07	3.47E-07	3.00E-09	1.61E-08	2.76E-07	2.95E-07	1.27E-03	3.64E-08	2.00E-07	
1.04E-08	3.00E-07	3.09E-06	0.00E+00	1.20E-08	4.61E-08	5.82E-10	5.87E-08	3.00E-09	1.61E-08	5.35E-10	1.97E-08	1.09E-03	7.29E-07	2.21E-07	
1.72E-08	7.85E-08	1.03E-06	2.97E-09	8.00E-09	7.26E-09	1.46E-09	1.67E-08	2.00E-09	2.54E-09	1.35E-09	5.89E-09	3.00E-04	4.07E-09	6.89E-09	
3.32E-08	3.24E-07	3.63E-07	2.30E-09	8.00E-09	7.27E-09	2.12E-08	3.65E-08	2.00E-09	2.55E-09	2.03E-08	2.48E-08	2.43E-04	1.54E-09	3.83E-08	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.36E-09	0.00E+00	1.24E-08	2.00E-09	1.53E-09	0.00E+00	3.53E-09	0.00E+00	0.00E+00	0.00E+00	
1.46E-09	3.46E-09	2.26E-07	1.46E-09	8.00E-09	3.79E-09	9.14E-10	1.27E-08	2.00E-09	1.33E-09	8.41E-10	4.17E-09	1.47E-04	4.66E-10	6.39E-10	
4.77E-08	2.14E-07	2.09E-06	3.48E-09	8.00E-09	8.74E-09	2.45E-09	1.92E-08	2.00E-09	3.06E-09	2.25E-09	7.31E-09	3.51E-04	1.03E-08	1.43E-08	
3.08E-07	1.59E-06	1.93E-06	3.96E-09	8.00E-09	1.01E-08	2.32E-07	2.50E-07	2.00E-09	3.54E-09	2.22E-07	2.27E-07	4.18E-04	1.43E-08	6.58E-08	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.39E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00	
1.47E-09	3.47E-09	2.27E-07	1.46E-09	8.00E-09	3.78E-09	1.07E-09	1.28E-08	2.00E-09	1.32E-09	9.80E-10	4.30E-09	1.48E-04	4.71E-10	6.50E-10	
1.89E-08	1.24E-07	1.16E-06	3.75E-09	8.00E-09	8.45E-09	1.51E-09	1.80E-08	2.00E-09	2.96E-09	1.39E-09	6.35E-09	3.79E-04	4.47E-09	8.97E-09	
1.54E-08	7.50E-08	1.34E-07	3.19E-09	8.00E-09	8.19E-09	7.25E-09	2.34E-08	2.00E-09	2.86E-09	6.94E-09	1.18E-08	3.37E-04	7.17E-10	5.31E-08	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.35E-09	0.00E+00	1.24E-08	2.00E-09	1.52E-09	0.00E+00	3.52E-09	0.00E+00	0.00E+00	0.00E+00	
1.44E-09	3.41E-09	2.23E-07	1.44E-09	8.00E-09	3.79E-09	1.04E-09	1.28E-08	2.00E-09	1.33E-09	9.52E-10	4.28E-09	1.45E-04	4.64E-10	6.42E-10	
6.84E-08	2.99E-07	1.53E-06	9.47E-09	8.00E-09	7.80E-08	2.05E-09	8.80E-08	2.00E-09	2.73E-08	1.89E-09	3.12E-08	9.57E-04	1.34E-08	1.66E-08	
2.47E-07	2.84E-06	7.32E-07	6.12E-09	1.20E-08	7.80E-08	5.63E-08	1.46E-07	3.00E-09	2.73E-08	5.38E-08	8.41E-08	6.46E-04	1.15E-08	1.02E-07	
6.01E-08	2.88E-07	1.39E-06	1.06E-08	8.00E-09	9.10E-08	1.87E-09	1.01E-07	2.00E-09	3.19E-08	1.72E-09	3.56E-08	1.07E-03	1.22E-08	1.62E-08	
2.12E-07	2.04E-06	5.71E-07	7.52E-09	1.20E-08	9.10E-08	4.74E-08	1.50E-07	3.00E-09	3.19E-08	4.54E-08	8.02E-08	7.94E-04	9.83E-09	1.25E-07	
1.45E-06	7.10E-07	1.68E-05	1.92E-09	4.00E-09	1.20E-08	1.91E-09	1.79E-08	1.00E-09	4.20E-09	1.80E-09	7.00E-09	1.94E-04	2.07E-07	4.55E-08	
3.58E-08	2.10E-07	1.59E-06	4.55E-09	8.00E-09	8.71E-09	1.65E-09	1.84E-08	2.00E-09	3.05E-09	1.52E-09	6.57E-09	4.59E-04	7.54E-09	1.33E-08	
1.34E-08	9.24E-08	2.00E-07	4.12E-09	8.00E-09	8.20E-09	7.06E-09	2.33E-08	2.00E-09	2.87E-09	6.75E-09	1.16E-08	4.35E-04	6.23E-10	6.85E-08	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.43E-09	0.00E+00	1.24E-08	2.00E-09	1.55E-09	0.00E+00	3.55E-09	0.00E+00	0.00E+00	0.00E+00	
1.46E-09	3.46E-09	2.27E-07	1.46E-09	8.00E-09	3.78E-09	1.07E-09	1.28E-08	2.00E-09	1.32E-09	9.82E-10	4.31E-09	1.48E-04	4.70E-10	6.48E-10	
1.23E-07	5.78E-07	3.28E-06	1.93E-08	1.20E-08	4.50E-08	2.15E-09	5.92E-08	3.00E-09	1.58E-08	1.98E-09	2.07E-08	1.95E-03	2.43E-08	3.24E-08	
1.31E-07	4.90E-06	4.52E-07	1.02E-08	1.60E-08	4.48E-08	1.31E-07	1.91E-07	4.00E-09	1.57E-08	1.25E-07	1.45E-07	1.08E-03	6.10E-09	1.70E-07	
1.77E-07	4.33E-06	6.23E-07	1.66E-08	1.20E-08	7.91E-08	1.08E-07	1.99E-07	3.00E-09	2.77E-08	1.03E-07	1.34E-07	1.76E-03	8.24E-09	2.77E-07	
1.20E-07	8.70E-07	2.76E-06	1.84E-08	1.20E-08	4.48E-08	7.69E-10	5.76E-08	3.00E-09	1.57E-08	7.07E-10	1.94E-08	1.85E-03	2.47E-08	3.94E-08	
4.50E-07	7.06E-06	1.68E-06	2.08E-08	0.00E+00	0.00E+00	1.75E-07	1.75E-07	0.00E+00	0.00E+00	1.68E-07	1.68E-07	2.20E-03	2.09E-08	3.46E-07	
4.71E-07	8.54E-07	1.05E-05	8.23E-09	8.00E-09	4.49E-08	3.40E-09	5.63E-08	2.00E-09	1.57E-08	3.16E-09	2.09E-08	8.31E-04	7.41E-08	3.99E-08	
5.31E-08	3.64E-06	1.64E-07	1.08E-08	1.20E-08	4.49E-08	2.02E-08	7.72E-08	3.00E-09	1.57E-08	1.94E-08	3.81E-08	1.14E-03	2.47E-09	1.80E-07	
5.20E-08	6.41E-07	1.26E-05	0.00E+00	1.20E-08	4.49E-08	3.67E-09	6.06E-08	3.00E-09	1.57E-08	3.38E-09	2.21E-08	1.31E-03	3.64E-06	2.66E-07	
8.78E-08	2.18E-06	3.12E-07	1.08E-08	1.20E-08	4.23E-08	7.44E-08	1.29E-07	3.00E-09	1.48E-08	7.12E-08	8.90E-08	1.14E-03	4.08E-09	1.79E-07	
5.99E-08	1.64E-06	2.28E-07	1.07E-08	1.20E-08	4.23E-08	5.44E-08	1.09E-07	3.00E-09	1.48E-08	5.21E-08	6.99E-08	1.13E-03	2.78E-09	1.78E-07	
8.56E-08	2.14E-06	3.18E-07	1.06E-08	1.20E-08	4.23E-08	7.67E-08	1.31E-07	3.00E-09	1.48E-08	7.34E-08	9.12E-08	1.12E-03	3.97E-09	1.76E-07	
8.48E-08	2.28E-06	2.89E-07	9.99E-09	1.20E-08	4.23E-08	6.94E-08	1.24E-07	3.00E-09	1.48E-08	6.64E-08	8.42E-08	1.06E-03	3.94E-09	1.66E-07	
5.67E-07	7.12E-06	1.49E-06	1.19E-08	1.20E-08	4.76E-08	2.29E-07	2.89E-07	3.00E-09	1.66E-08	2.20E-07	2.39E-07	1.26E-03	2.63E-08	1.98E-07	
1.04E-08	2.97E-07	3.25E-06	0.00E+00	1.20E-08	4.76E-08	6.54E-10	6.02E-08	3.00E-09	1.66E-08	6.02E-10	2.02E-08	1.11E-03	7.28E-07	2.27E-07	
2.80E-07	3.98E-06	7.42E-07	1.17E-08	1.20E-08	4.76E-08	1.08E-07	1.68E-07	3.00E-09	1.66E-08	1.03E-07	1.23E-07	1.24E-03	1.30E-08	1.95E-07	
1.04E-08	3.00E-07	3.25E-06	0.00E+00	1.20E-08	4.76E-08	6.39E-10	6.02E-08	3.00E-09	1.66E-08	5.87E-10	2.02E-08	1.11E-03	7.27E-07	2.27E-07	
4.35E-07	5.63E-06	1.14E-06	1.17E-08	1.20E-08	4.76E-08	1.78E-07	2.37E-07	3.00E-09	1.66E-08	1.70E-07	1.90E-07	1.24E-03	2.02E-08	1.95E-07	
1.04E-08	2.98E-07	3.25E-06	0.00E+00	1.20E-08	4.76E-08	6.48E-10	6.02E-08	3.00E-09	1.66E-08	5.96E-10	2.02E-08	1.11E-03	7.28E-07	2.26E-07	
4.82E-07	6.94E-06	1.26E-06	1.18E-08	1.20E-08	4.76E-08	2.19E-07	2.79E-07	3.00E-09	1.66E-08	2.10E-07	2.29E-07	1.25E-03	2.24E-08	1.96E-07	
1.05E-08	2.84E-07	3.28E-06	0.00E+00	1.20E-08	4.76E-08	7.30E-10	6.03E-08	3.00E-09	1.66E-08	6.71E-10	2.03E-08	1.09E-03	7.36E-07	2.22E-07	
5.02E-07	7.70E-06	1.41E-06	1.12E-08	1.20E-08	4.49E-08	2.58E-07	3.14E-07	3.00E-09	1.57E-08	2.46E-07	2.65E-07	1.19E-03	2.33E-08	1.87E-07	
7.97E-09	2.28E-07	2.83E-06	0.00E+00	1.20E-08	4.49E-08	5.11E-10	5.74E-08	3.00E-09	1.57E-08	4.69E-10	1.92E-08	9.65E-04	5.58E-07	1.97E-07	
1.68E-07	2.84E-06	5.08E-07	1.10E-08	1.20E-08	4.49E-08	8.85E-08	1.45E-07	3.00E-09	1.57E-08	8.47E-08	1.03E-07	1.16E-03	7.81E-09	1.83E-07	
7.93E-09	2.31E-07	2.83E-06	0.00E+00	1.20E-08	4.49E-08	4.93E-10	5.74E-08	3.00E-09	1.57E-08	4.54E-10	1.92E-08	9.64E-04	5.55E-07	1.96E-07	
2.94E-07	4.68E-06	8.53E-07	1.10E-08	1.20E-08	4.49E-08	1.53E-07	2.09E-07	3.00E-09	1.57E-08	1.46E-07	1.65E-07	1.16E-03	1.36E-08	1.82E-07	
8.01E-09	2.24E-07	2.83E-06	0.00E+00	1.20E-08	4.49E-08	5.35E-10	5.74E-08	3.00E-09	1.57E-08	4.92E-10	1.92E-08	9.66E-04	5.61E-07	1.97E-07	
2.51E-07	4.35E-06	6.99E-07	1.10E-08	1.20E-08	4.49E-08	1.34E-07	1.91E-07	3.00E-09	1.57E-08	1.28E-07	1.47E-07	1.16E-03	1.17E-08	1.83E-07	
8.72E-09	1.64E-07	2.80E-06	0.00E+00	1.20E-08	4.49E-08	9.07E-10	5.78E-08	3.00E-09	1.57E-08	8.34E-10	1.95E-08	9.36E-04	6.10E-07	1.91E-07	
5.67E-07	7.27E-06	1.58E-06	1.14E-08	1.20E-08	4.49E-08	3.33E-07	3.90E-07	3.00E-09	1.57E-08	3.19E-07	3.37E-07	1.21E-03	2.63E-08	1.90E-07	
1.65E-07	4.27E-06	4.58E-07	1.07E-08	1.20E-08	4.49E-08	6.85E-08	1.25E-07	3.00E-09	1.57E-08	6.56E-08	8.43E-08	1.13E-03	7.68E-09	1.78E-07	
8.54E-09	1.80E-07	2.81E-06	0.00E+00	1.20E-08	4.49E-08	8.12E-10	5.77E-08	3.00E-09	1.57E-08	7.47E-10	1.94E-08	9.36E-04	5.97E-07	1.91E-07	
8.78E-08	2.18E-06	3.12E-07	1.08E-08	1.20E-08	4.23E-08	7.44E-08	1.29E-07	3.00E-09	1.48E-08	7.12E-08	8.90E-08	1.14E-03	4.08E-09	1.79E-07	
5.99E-08	1.64E-06	2.28E-07	1.07E-08	1.20E-08	4.23E-08	5.44E-08	1.09E-07	3.00E-09	1.48E-08	5.21E-08	6.99E-08	1.13E-03	2.78E-09	1.78E-07	
8.56E-08	2.14E-06	3.18E-07	1.06E-08	1.20E-08	4.23E-08	7.67E-08	1.31E-07	3.00E-09	1.48E-08	7.34E-08	9.12E-08	1.12E-03	3.97E-09	1.76E-07	
9.39E-08	2.39E-06	3.19E-07	9.98E-09	1.20E-08	4.23E-08	7.66E-08	1.31E-07	3.00E-09	1.48E-08	7.33E-08	9.11E-08	1.05E-03	4.36E-09	1.66E-07	
1.16E-07	8.19E-06	2.70E-07	1.22E-08	1.20E-08	4.62E-08	4.12E-08	9.94E-08	3.00E-09	1.62E-08	3.94E-08	5.86E-08	1.29E-03	5.37E-09	2.03E-07	
1.10E-08	3.17E-07	3.03E-06	0.00E+00	1.20E-08	4.62E-08	5.68E-10	5.87E-08	3.00E-09	1.62E-08	5.23E-10	1.97E-08	1.07E-03	7.72E-07	2.18E-07	
6.54E-08	3.59E-06	1.77E-07	1.18E-08	1.20E-08	4.62E-08	1.78E-08	7.59E-08	3.00E-09	1.62E-08	1.70E-08	3.62E-08	1.25E-03	3.04E-09	1.96E-07	

1.22E-08	1.31E-07	3.08E-06	0.00E+00	1.20E-08	4.62E-08	1.45E-09	5.96E-08	3.00E-09	1.62E-08	1.33E-09	2.05E-08	1.06E-03	8.52E-07	2.16E-07
1.18E-07	7.79E-06	2.64E-07	1.22E-08	1.20E-08	4.62E-08	5.19E-08	1.10E-07	3.00E-09	1.62E-08	4.97E-08	6.88E-08	1.29E-03	5.50E-09	2.03E-07
1.19E-08	1.76E-07	3.09E-06	0.00E+00	1.20E-08	4.62E-08	1.24E-09	5.94E-08	3.00E-09	1.62E-08	1.14E-09	2.03E-08	1.05E-03	8.33E-07	2.13E-07
1.48E-07	9.61E-06	3.12E-07	1.24E-08	1.20E-08	4.62E-08	6.92E-08	1.27E-07	3.00E-09	1.62E-08	6.62E-08	8.54E-08	1.31E-03	6.86E-09	2.07E-07
1.19E-08	1.81E-07	3.10E-06	0.00E+00	1.20E-08	4.62E-08	1.21E-09	5.94E-08	3.00E-09	1.62E-08	1.11E-09	2.03E-08	1.04E-03	8.31E-07	2.12E-07
2.45E-08	1.27E-06	9.54E-08	1.08E-08	1.20E-08	4.55E-08	6.14E-09	6.36E-08	3.00E-09	1.59E-08	5.88E-09	2.48E-08	1.14E-03	1.14E-09	1.79E-07
9.34E-09	2.70E-07	2.89E-06	0.00E+00	1.20E-08	4.55E-08	5.18E-10	5.80E-08	3.00E-09	1.59E-08	4.76E-10	1.94E-08	1.01E-03	6.54E-07	2.06E-07
3.71E-08	2.08E-06	1.24E-07	1.10E-08	1.20E-08	4.55E-08	1.08E-08	6.83E-08	3.00E-09	1.59E-08	1.03E-08	2.92E-08	1.17E-03	1.72E-09	1.83E-07
9.34E-09	2.70E-07	2.89E-06	0.00E+00	1.20E-08	4.55E-08	5.18E-10	5.80E-08	3.00E-09	1.59E-08	4.76E-10	1.94E-08	9.95E-04	6.54E-07	2.03E-07
2.80E-08	1.92E-06	1.00E-07	1.10E-08	1.20E-08	4.55E-08	1.03E-08	6.78E-08	3.00E-09	1.59E-08	9.87E-09	2.88E-08	1.17E-03	1.30E-09	1.83E-07
9.34E-09	2.70E-07	2.89E-06	0.00E+00	1.20E-08	4.55E-08	5.18E-10	5.80E-08	3.00E-09	1.59E-08	4.76E-10	1.94E-08	1.00E-03	6.54E-07	2.04E-07
2.58E-07	1.33E-06	5.81E-06	1.88E-08	1.20E-08	4.50E-08	2.08E-09	5.91E-08	3.00E-09	1.58E-08	1.92E-09	2.07E-08	1.90E-03	4.74E-08	5.56E-08
8.81E-08	3.58E-06	3.24E-07	1.51E-08	3.60E-08	7.73E-08	6.62E-08	1.80E-07	9.00E-09	2.71E-08	6.33E-08	9.94E-08	1.60E-03	4.09E-09	2.52E-07
1.32E-08	2.62E-07	4.60E-06	0.00E+00	3.60E-08	7.41E-08	1.74E-09	1.12E-07	9.00E-09	2.59E-08	1.60E-09	3.65E-08	1.18E-03	9.23E-07	2.41E-07
1.45E-07	3.84E-06	5.72E-07	1.52E-08	3.60E-08	7.82E-08	1.09E-07	2.24E-07	9.00E-09	2.74E-08	1.05E-07	1.41E-07	1.61E-03	6.74E-09	2.54E-07
1.03E-07	3.74E-06	3.75E-07	1.51E-08	3.60E-08	7.75E-08	7.38E-08	1.87E-07	9.00E-09	2.71E-08	7.06E-08	1.07E-07	1.60E-03	4.78E-09	2.52E-07
1.19E-07	4.46E-06	3.80E-07	1.63E-08	3.60E-08	9.40E-08	3.11E-08	1.61E-07	9.00E-09	3.29E-08	2.98E-08	7.17E-08	1.72E-03	5.53E-09	2.71E-07
1.47E-07	4.97E-06	4.69E-07	1.63E-08	3.60E-08	9.60E-08	4.14E-08	1.73E-07	9.00E-09	3.36E-08	3.96E-08	8.22E-08	1.73E-03	6.85E-09	2.72E-07
1.70E-08	7.05E-07	1.10E-05	0.00E+00	3.60E-08	8.52E-08	1.36E-09	1.23E-07	9.00E-09	2.98E-08	1.25E-09	4.01E-08	1.49E-03	1.19E-06	3.04E-07
1.73E-07	1.27E-05	5.50E-07	1.87E-08	3.60E-08	1.21E-07	8.30E-08	2.40E-07	9.00E-09	4.24E-08	7.94E-08	1.31E-07	1.98E-03	8.01E-09	3.12E-07
2.61E-08	7.55E-07	1.07E-05	0.00E+00	3.60E-08	1.07E-07	2.46E-09	1.45E-07	9.00E-09	3.75E-08	2.26E-09	4.87E-08	1.68E-03	1.83E-06	3.43E-07
1.73E-07	4.05E-06	6.29E-07	1.62E-08	3.60E-08	8.68E-08	1.11E-07	2.33E-07	9.00E-09	3.04E-08	1.06E-07	1.45E-07	1.71E-03	8.02E-09	2.69E-07
1.51E-08	4.28E-07	7.58E-06	0.00E+00	3.60E-08	8.16E-08	1.68E-09	1.19E-07	9.00E-09	2.86E-08	1.54E-09	3.91E-08	1.28E-03	1.06E-06	2.60E-07
2.06E-07	5.33E-06	7.69E-07	1.60E-08	3.60E-08	8.91E-08	1.31E-07	2.56E-07	9.00E-09	3.12E-08	1.25E-07	1.65E-07	1.69E-03	9.58E-09	2.67E-07
1.51E-08	4.26E-07	7.57E-06	0.00E+00	3.60E-08	8.24E-08	1.68E-09	1.20E-07	9.00E-09	2.88E-08	1.54E-09	3.94E-08	1.32E-03	1.06E-06	2.68E-07
2.37E-07	5.43E-06	8.92E-07	1.61E-08	3.60E-08	8.97E-08	1.56E-07	2.82E-07	9.00E-09	3.14E-08	1.49E-07	1.90E-07	1.70E-03	1.10E-08	2.68E-07
1.51E-08	4.26E-07	7.59E-06	0.00E+00	3.60E-08	8.29E-08	1.68E-09	1.21E-07	9.00E-09	2.90E-08	1.54E-09	3.96E-08	1.31E-03	1.06E-06	2.67E-07
3.05E-08	8.80E-06	8.25E-08	3.90E-08	3.60E-08	2.10E-07	1.36E-08	2.60E-07	9.00E-09	7.35E-08	1.30E-08	9.55E-08	4.12E-03	1.42E-09	6.49E-07
1.30E-07	2.64E-06	2.50E-05	0.00E+00	3.60E-08	2.10E-07	2.74E-09	2.49E-07	9.00E-09	7.35E-08	2.52E-09	8.50E-08	1.72E-03	5.48E-06	3.51E-07
1.49E-07	4.88E-06	5.39E-07	1.51E-08	3.60E-08	8.54E-08	8.69E-08	2.08E-07	9.00E-09	2.99E-08	8.32E-08	1.22E-07	1.60E-03	6.91E-09	2.51E-07
1.42E-08	5.64E-07	9.76E-06	0.00E+00	3.60E-08	7.85E-08	1.24E-09	1.16E-07	9.00E-09	2.75E-08	1.14E-09	3.76E-08	1.22E-03	9.96E-07	2.49E-07
4.10E-08	2.46E-06	1.98E-07	1.68E-08	3.60E-08	9.84E-08	1.14E-08	1.46E-07	9.00E-09	3.44E-08	1.09E-08	5.43E-08	1.78E-03	1.90E-09	2.80E-07
9.28E-06	2.69E-05	2.61E-04	2.92E-08	2.00E-08	1.18E-07	1.82E-08	1.56E-07	5.00E-09	4.13E-08	1.71E-08	6.34E-08	2.95E-03	1.10E-06	5.76E-07
1.03E-08	9.66E-08	4.08E-07	1.37E-08	1.00E-08	1.01E-07	1.22E-09	1.12E-07	2.50E-09	3.52E-08	1.12E-09	3.88E-08	1.39E-03	3.24E-09	1.03E-08
1.12E-07	2.03E-06	1.53E-07	1.33E-08	3.09E-08	1.10E-07	7.36E-09	1.48E-07	7.73E-09	3.85E-08	7.04E-09	5.33E-08	1.41E-03	5.20E-09	2.21E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-08	5.50E-08	0.00E+00	7.80E-08	5.75E-09	1.93E-08	0.00E+00	2.50E-08	0.00E+00	0.00E+00	0.00E+00

Existing in Year 2045: Criteria Air Pollutants

Source: EMFAC2021 (v1.0.2) Emission Rates, Contra Costa County, Average Speed, Average Fleet

Source: F&P 2023	Small Trucks	Medium Trucks	Heavy Trucks	Passenger Vehicles
Truck Trip Percentage	1.2%	0.1%	0.4%	98.3%
EMFAC Default	3.44%	1.10%	2.99%	92.47%

Daily VMT	**3,530,197**			**lbs/day**					
Vehicle Type	**Fuel Type**	**Percent of VMT**	**Adjusted Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	0.02%	0.00%	0.01	0.22	0.04	0.00	0.01	0.01
All Other Buses	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
LDA	Gasoline	42.85%	45.57%	9.92	69.74	1,629.40	7.80	56.48	17.93
LDA	Diesel	0.03%	0.03%	0.01	0.04	0.28	0.00	0.04	0.01
LDA	Electricity	6.20%	6.59%	0.00	0.00	0.00	0.00	6.36	1.81
LDA	Plug-in Hybrid	2.05%	2.18%	0.19	0.45	29.29	0.19	2.07	0.61
LDT1	Gasoline	2.66%	2.83%	0.69	4.75	108.32	0.56	3.83	1.23
LDT1	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.08%	0.09%	0.00	0.00	0.00	0.00	0.09	0.02
LDT1	Plug-in Hybrid	0.06%	0.07%	0.01	0.01	0.91	0.01	0.06	0.02
LDT2	Gasoline	22.89%	24.34%	7.45	43.58	1,026.34	5.02	32.72	10.49
LDT2	Diesel	0.09%	0.09%	0.08	0.20	0.89	0.02	0.15	0.07
LDT2	Electricity	0.64%	0.68%	0.00	0.00	0.00	0.00	0.66	0.19
LDT2	Plug-in Hybrid	0.62%	0.66%	0.06	0.14	8.93	0.06	0.63	0.19
LHD1	Gasoline	0.93%	0.32%	0.11	0.55	14.75	0.19	2.17	0.76
LHD1	Diesel	0.61%	0.21%	1.48	4.90	3.83	0.09	1.78	0.80
LHD1	Electricity	1.21%	0.41%	0.00	0.00	0.00	0.00	1.51	0.50
LHD2	Gasoline	0.11%	0.04%	0.01	0.06	1.69	0.02	0.28	0.10
LHD2	Diesel	0.29%	0.10%	0.86	3.28	2.27	0.05	0.97	0.45
LHD2	Electricity	0.29%	0.31%	0.00	0.00	0.00	0.00	1.29	0.43
MCY	Gasoline	0.33%	0.35%	21.28	12.86	267.92	0.05	0.49	0.20
MDV	Gasoline	12.87%	13.68%	4.80	28.74	610.63	3.44	18.57	5.97
MDV	Diesel	0.14%	0.15%	0.05	0.14	1.60	0.04	0.21	0.07
MDV	Electricity	0.58%	0.62%	0.00	0.00	0.00	0.00	0.60	0.17
MDV	Plug-in Hybrid	0.38%	0.41%	0.04	0.08	5.46	0.04	0.39	0.11
MH	Gasoline	0.04%	0.00%	0.00	0.07	0.06	0.01	0.02	0.01
MH	Diesel	0.02%	0.00%	0.02	0.56	0.06	0.00	0.02	0.01
Motor Coach	Diesel	0.01%	0.00%	0.00	0.12	0.00	0.00	0.02	0.01
OBUS	Gasoline	0.01%	0.00%	0.00	0.04	0.07	0.00	0.01	0.00
OBUS	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
PTO	Diesel	0.03%	0.00%	0.00	0.77	0.05	0.00	0.00	0.00
PTO	Electricity	0.03%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.02%	0.00%	0.00	0.02	0.03	0.00	0.01	0.00
SBUS	Diesel	0.02%	0.00%	0.00	0.08	0.01	0.00	0.01	0.00
SBUS	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
SBUS	Natural Gas	0.00%	0.00%	0.00	0.00	0.09	0.00	0.00	0.00
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.01%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.02%	0.00%	0.00	0.04	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 4	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.01%	0.00%	0.00	0.04	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 5	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.03%	0.00%	0.00	0.08	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 6	Electricity	0.03%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.01%	0.00%	0.00	0.04	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00

T6 Instate Other Class 4	Diesel	0.05%	0.00%	0.00	0.09	0.01	0.00	0.02	0.01
T6 Instate Other Class 4	Electricity	0.06%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.12%	0.01%	0.00	0.21	0.03	0.01	0.05	0.02
T6 Instate Other Class 5	Electricity	0.13%	0.01%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.09%	0.01%	0.00	0.16	0.03	0.01	0.04	0.01
T6 Instate Other Class 6	Electricity	0.10%	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.07%	0.01%	0.00	0.22	0.02	0.00	0.03	0.01
T6 Instate Other Class 7	Electricity	0.05%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.01%	0.00%	0.00	0.04	0.00	0.00	0.01	0.00
T6 Instate Tractor Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.01%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 4	Diesel	0.01%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.01%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Public Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.01%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.02%	0.00%	0.00	0.06	0.01	0.00	0.01	0.00
T6 Public Class 7	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Utility Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.08%	0.01%	0.01	0.04	0.10	0.01	0.03	0.01
T6TS	Electricity	0.09%	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
T7 CAIRP Class 8	Diesel	0.43%	0.06%	0.05	5.42	0.17	0.05	0.66	0.30
T7 CAIRP Class 8	Electricity	0.12%	0.02%	0.00	0.00	0.00	0.00	0.10	0.03
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T7 NNOOS Class 8	Diesel	0.66%	0.09%	0.08	9.12	0.26	0.08	1.01	0.45
T7 NOOS Class 8	Diesel	0.24%	0.03%	0.03	3.41	0.10	0.03	0.37	0.17
T7 Other Port Class 8	Diesel	0.05%	0.01%	0.00	0.58	0.03	0.01	0.07	0.03
T7 Other Port Class 8	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 POAK Class 8	Diesel	0.16%	0.02%	0.02	2.09	0.11	0.02	0.24	0.10
T7 POAK Class 8	Electricity	0.04%	0.00%	0.00	0.00	0.00	0.00	0.03	0.01
T7 POAK Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T7 Public Class 8	Diesel	0.04%	0.01%	0.01	0.92	0.07	0.01	0.07	0.03
T7 Public Class 8	Electricity	0.03%	0.00%	0.00	0.00	0.00	0.00	0.03	0.01
T7 Public Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Diesel	0.01%	0.00%	0.00	0.07	0.00	0.00	0.01	0.00
T7 Single Concrete/Transit Mix Class 8	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	0.06%	0.01%	0.01	0.66	0.03	0.01	0.08	0.03
T7 Single Dump Class 8	Electricity	0.05%	0.01%	0.00	0.00	0.00	0.00	0.04	0.01
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.17	0.00	0.00	0.00
T7 Single Other Class 8	Diesel	0.07%	0.01%	0.01	0.75	0.04	0.01	0.10	0.04
T7 Single Other Class 8	Electricity	0.07%	0.01%	0.00	0.00	0.00	0.00	0.06	0.02
T7 Single Other Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.19	0.00	0.01	0.00

T7 SWCV Class 8	Diesel	0.01%	0.00%	0.00	0.34	0.01	0.00	0.02	0.01
T7 SWCV Class 8	Electricity	0.04%	0.00%	0.00	0.00	0.00	0.00	0.05	0.02
T7 SWCV Class 8	Natural Gas	0.05%	0.01%	0.01	0.18	5.54	0.00	0.12	0.04
T7 Tractor Class 8	Diesel	0.40%	0.05%	0.04	4.92	0.20	0.05	0.59	0.25
T7 Tractor Class 8	Electricity	0.08%	0.01%	0.00	0.00	0.00	0.00	0.07	0.02
T7 Tractor Class 8	Natural Gas	0.03%	0.00%	0.01	0.07	1.43	0.00	0.04	0.01
T7 Utility Class 8	Diesel	0.00%	0.00%	0.00	0.05	0.00	0.00	0.01	0.00
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.00%	0.00	0.01	0.08	0.00	0.00	0.00
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.01%	0.00%	0.00	0.00	0.05	0.00	0.01	0.00
UBUS	Electricity	0.09%	0.01%	0.00	0.00	0.00	0.00	0.08	0.02
		100%	100%	47	201	3,722	18	136	44

Year 2045: Criteria Air Pollutants

Source: EMFAC2021 (v1.0.2) Emission Rates, Contra Costa County, Average Speed, Average Fleet

Source: F&P 2023	Small Trucks	Medium Trucks	Heavy Trucks	Passenger Vehicles
Truck Trip Percentage	1.3%	0.1%	0.4%	98.2%
EMFAC Default	3.44%	1.10%	2.99%	92.47%

Daily VMT	**4,272,206**			**lbs/day**					
Vehicle Type	**Fuel Type**	**Percent of VMT**	**Adjusted Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	0.02%	0.00%	0.01	0.28	0.05	0.00	0.02	0.01
All Other Buses	Natural Gas	0.00%	0.00%	0.00	0.00	0.12	0.00	0.00	0.00
LDA	Gasoline	42.85%	45.51%	11.99	84.29	1,969.41	9.43	68.27	21.67
LDA	Diesel	0.03%	0.03%	0.01	0.05	0.34	0.00	0.04	0.02
LDA	Electricity	6.20%	6.58%	0.00	0.00	0.00	0.00	7.68	2.19
LDA	Plug-in Hybrid	2.05%	2.17%	0.23	0.54	35.40	0.23	2.50	0.73
LDT1	Gasoline	2.66%	2.83%	0.83	5.75	130.92	0.68	4.63	1.49
LDT1	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.08%	0.09%	0.00	0.00	0.00	0.00	0.10	0.03
LDT1	Plug-in Hybrid	0.06%	0.07%	0.01	0.02	1.10	0.01	0.08	0.02
LDT2	Gasoline	22.89%	24.31%	9.00	52.67	1,240.50	6.07	39.54	12.68
LDT2	Diesel	0.09%	0.09%	0.10	0.24	1.07	0.02	0.18	0.08
LDT2	Electricity	0.64%	0.68%	0.00	0.00	0.00	0.00	0.79	0.23
LDT2	Plug-in Hybrid	0.62%	0.66%	0.07	0.16	10.79	0.07	0.76	0.22
LHD1	Gasoline	0.93%	0.34%	0.14	0.71	19.13	0.24	2.81	0.98
LHD1	Diesel	0.61%	0.22%	1.92	6.35	4.96	0.12	2.30	1.03
LHD1	Electricity	1.21%	0.44%	0.00	0.00	0.00	0.00	1.96	0.65
LHD2	Gasoline	0.11%	0.04%	0.01	0.08	2.20	0.03	0.37	0.13
LHD2	Diesel	0.29%	0.10%	1.12	4.25	2.94	0.07	1.26	0.58
LHD2	Electricity	0.29%	0.11%	0.00	0.00	0.00	0.00	0.54	0.18
MCY	Gasoline	0.33%	0.35%	25.72	15.54	323.82	0.06	0.60	0.24
MDV	Gasoline	12.87%	13.66%	5.80	34.73	738.05	4.15	22.45	7.22
MDV	Diesel	0.14%	0.15%	0.06	0.17	1.94	0.04	0.26	0.09
MDV	Electricity	0.58%	0.62%	0.00	0.00	0.00	0.00	0.72	0.21
MDV	Plug-in Hybrid	0.38%	0.41%	0.04	0.10	6.60	0.04	0.47	0.14
MH	Gasoline	0.04%	0.01%	0.01	0.10	0.08	0.01	0.03	0.01
MH	Diesel	0.02%	0.00%	0.02	0.73	0.07	0.00	0.03	0.01
Motor Coach	Diesel	0.01%	0.00%	0.00	0.16	0.01	0.00	0.02	0.01
OBUS	Gasoline	0.01%	0.00%	0.00	0.05	0.09	0.00	0.01	0.00
OBUS	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
PTO	Diesel	0.03%	0.00%	0.01	1.00	0.07	0.01	0.00	0.00
PTO	Electricity	0.03%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.02%	0.00%	0.00	0.03	0.04	0.00	0.01	0.00
SBUS	Diesel	0.02%	0.00%	0.00	0.10	0.01	0.00	0.01	0.01
SBUS	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
SBUS	Natural Gas	0.00%	0.00%	0.00	0.00	0.11	0.00	0.00	0.00
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.01%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.02%	0.00%	0.00	0.06	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 4	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.01%	0.00%	0.00	0.05	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 5	Electricity	0.02%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.03%	0.00%	0.00	0.11	0.02	0.00	0.02	0.01
T6 Instate Delivery Class 6	Electricity	0.03%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.01%	0.00%	0.00	0.05	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00

T6 Instate Other Class 4	Diesel	0.05%	0.00%	0.00	0.12	0.02	0.00	0.03	0.01
T6 Instate Other Class 4	Electricity	0.06%	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.12%	0.01%	0.01	0.28	0.04	0.01	0.06	0.02
T6 Instate Other Class 5	Electricity	0.13%	0.01%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.09%	0.01%	0.00	0.22	0.03	0.01	0.05	0.02
T6 Instate Other Class 6	Electricity	0.10%	0.01%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.07%	0.01%	0.00	0.30	0.03	0.01	0.04	0.01
T6 Instate Other Class 7	Electricity	0.05%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.01%	0.00%	0.00	0.05	0.01	0.00	0.01	0.00
T6 Instate Tractor Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.01%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 4	Diesel	0.01%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.01%	0.00%	0.00	0.05	0.01	0.00	0.01	0.00
T6 Public Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.01%	0.00%	0.00	0.04	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.02%	0.00%	0.00	0.07	0.01	0.00	0.01	0.00
T6 Public Class 7	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Utility Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.08%	0.01%	0.01	0.05	0.13	0.01	0.04	0.01
T6TS	Electricity	0.09%	0.01%	0.00	0.00	0.00	0.00	0.03	0.01
T7 CAIRP Class 8	Diesel	0.43%	0.06%	0.07	7.06	0.23	0.07	0.86	0.39
T7 CAIRP Class 8	Electricity	0.12%	0.02%	0.00	0.00	0.00	0.00	0.13	0.04
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T7 NNOOS Class 8	Diesel	0.66%	0.09%	0.10	11.88	0.34	0.10	1.31	0.59
T7 NOOS Class 8	Diesel	0.24%	0.03%	0.04	4.44	0.13	0.04	0.48	0.22
T7 Other Port Class 8	Diesel	0.05%	0.01%	0.01	0.75	0.04	0.01	0.09	0.04
T7 Other Port Class 8	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 POAK Class 8	Diesel	0.16%	0.02%	0.02	2.72	0.14	0.03	0.31	0.12
T7 POAK Class 8	Electricity	0.04%	0.01%	0.00	0.00	0.00	0.00	0.04	0.01
T7 POAK Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T7 Public Class 8	Diesel	0.04%	0.01%	0.02	1.19	0.09	0.01	0.09	0.03
T7 Public Class 8	Electricity	0.03%	0.00%	0.00	0.00	0.00	0.00	0.03	0.01
T7 Public Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Diesel	0.01%	0.00%	0.00	0.09	0.00	0.00	0.02	0.01
T7 Single Concrete/Transit Mix Class 8	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	0.06%	0.01%	0.01	0.86	0.04	0.01	0.11	0.04
T7 Single Dump Class 8	Electricity	0.05%	0.01%	0.00	0.00	0.00	0.00	0.06	0.02
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.22	0.00	0.01	0.00
T7 Single Other Class 8	Diesel	0.07%	0.01%	0.01	0.98	0.05	0.01	0.14	0.05
T7 Single Other Class 8	Electricity	0.07%	0.01%	0.00	0.00	0.00	0.00	0.08	0.02
T7 Single Other Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.25	0.00	0.01	0.00

T7 SWCV Class 8	Diesel	0.01%	0.00%	0.00	0.44	0.01	0.00	0.02	0.01
T7 SWCV Class 8	Electricity	0.04%	0.01%	0.00	0.00	0.00	0.00	0.07	0.02
T7 SWCV Class 8	Natural Gas	0.05%	0.01%	0.01	0.23	7.22	0.00	0.16	0.05
T7 Tractor Class 8	Diesel	0.40%	0.06%	0.06	6.41	0.26	0.07	0.77	0.32
T7 Tractor Class 8	Electricity	0.08%	0.01%	0.00	0.00	0.00	0.00	0.09	0.03
T7 Tractor Class 8	Natural Gas	0.03%	0.00%	0.01	0.09	1.87	0.00	0.06	0.02
T7 Utility Class 8	Diesel	0.00%	0.00%	0.00	0.06	0.01	0.00	0.01	0.00
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.00%	0.00	0.01	0.11	0.00	0.00	0.00
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.01%	0.00%	0.00	0.00	0.07	0.00	0.01	0.00
UBUS	Electricity	0.09%	0.01%	0.00	0.00	0.00	0.00	0.10	0.03
		100%	100%	57	247	4,502	22	164	53

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: Contra Costa
Calendar Year: 2045
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

g/mile

2.20E-03

Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	VMT Total	% of VMT
All Other Buses	Diesel	0.0482023	1.0396672	0.175379	0.0100037	0.013294	0.012	0.0461373	0.0714313	0.0127189	0.003	0.0161481	0.0318669	1056.4233	0.0022389	0.1664399	6,384	0.020%
All Other Buses	Natural Gas	0.0119435	0.1062462	3.378567	0	0.0015899	0.012	0.0461373	0.0597272	0.0014618	0.003	0.0161481	0.0206099	920.52685	0.8359115	0.1876554	110	0.000%
LDA	Gasoline	0.0027979	0.019665	0.4594603	0.0021999	0.0004938	0.008	0.0074333	0.0159271	0.0004541	0.002	0.0026016	0.0050557	222.52852	0.000965	0.0032065	13,762,597	42.851%
LDA	Diesel	0.004491	0.0185521	0.130639	0.0017278	0.0012758	0.008	0.0074618	0.0167376	0.0012206	0.002	0.0026116	0.0058322	182.34868	0.0002086	0.0287291	8,294	0.026%
LDA	Electricity	0	0	0	0	0	0.008	0.0043934	0.0123935	0	0.002	0.0015377	0.0035377	0	0	0	1,990,003	6.196%
LDA	Plug-in Hybrid	0.0011242	0.0026422	0.1728897	0.0011111	0.0002028	0.008	0.0039951	0.0121979	0.0001865	0.002	0.0013983	0.0035847	112.38798	0.0003425	0.0004464	657,425	2.047%
LDT1	Gasoline	0.0031204	0.0215819	0.4916631	0.0025531	0.0005447	0.008	0.0088326	0.0173773	0.0005008	0.002	0.0030914	0.0055922	258.25564	0.001054	0.0033835	854,993	2.662%
LDT1	Diesel	0.011547	0.0267724	0.1213164	0.0031902	0.0040887	0.008	0.0087537	0.0208424	0.0039118	0.002	0.0030638	0.0089756	336.67623	0.0005363	0.0530435	10	0.000%
LDT1	Electricity	0	0	0	0	0	0.008	0.0043945	0.0123945	0	0.002	0.0015381	0.0035381	0	0	0	26,674	0.083%
LDT1	Plug-in Hybrid	0.0011204	0.0026333	0.1723082	0.0011073	0.000195	0.008	0.0039983	0.0121932	0.0001793	0.002	0.0013994	0.0035787	112.00971	0.000343	0.0004491	20,424	0.064%
LDT2	Gasoline	0.0039313	0.0230043	0.5417927	0.0026496	0.0005136	0.008	0.0087577	0.0172712	0.0004722	0.002	0.0030652	0.0055374	268.01048	0.0012999	0.0034864	7,351,513	22.889%
LDT2	Diesel	0.01158	0.0274343	0.1218747	0.0023744	0.0041118	0.008	0.0087589	0.0208708	0.003934	0.002	0.0030656	0.0089996	250.5867	0.0005379	0.03948	28,253	0.088%
LDT2	Electricity	0	0	0	0	0	0.008	0.0043946	0.0123946	0	0.002	0.0015381	0.0035381	0	0	0	205,505	0.640%
LDT2	Plug-in Hybrid	0.0011226	0.0026384	0.1726353	0.0011095	0.0001992	0.008	0.0039981	0.0121972	0.0001831	0.002	0.0013993	0.0035825	112.22524	0.0003429	0.000448	200,691	0.625%
LHD1	Gasoline	0.0042341	0.0219607	0.593743	0.0074533	0.0012744	0.008	0.078	0.0872744	0.0011718	0.002	0.0273	0.0304718	753.92124	0.0012555	0.0018581	300,298	0.935%
LHD1	Diesel	0.0913701	0.3022812	0.2362061	0.005734	0.0196634	0.012	0.078	0.1096634	0.0188128	0.003	0.0273	0.0491128	605.14081	0.004244	0.0953402	195,896	0.610%
LHD1	Electricity	0	0	0	0	0	0.008	0.039	0.047	0	0.002	0.01365	0.01565	0	0	0	389,367	1.212%
LHD2	Gasoline	0.0036018	0.0216063	0.6028785	0.0083574	0.0012565	0.008	0.091	0.1002565	0.0011553	0.002	0.03185	0.0350053	845.37532	0.0011059	0.0021771	33,970	0.106%
LHD2	Diesel	0.1133306	0.4307398	0.2975405	0.0067019	0.0248746	0.012	0.091	0.1278746	0.0237985	0.003	0.03185	0.0586485	707.28933	0.005264	0.1114337	92,038	0.287%
LHD2	Electricity	0	0	0	0	0	0.008	0.0455	0.0535	0	0.002	0.015925	0.017925	0	0	0	93,744	0.292%
MCY	Gasoline	0.7803644	0.4714589	9.8257191	0.0018259	0.0021187	0.004	0.012	0.0181187	0.0019754	0.001	0.0042	0.0071754	184.69102	0.1309164	0.0354614	105,817	0.329%
MDV	Gasoline	0.0045044	0.026989	0.573515	0.0032271	0.0005307	0.008	0.0089116	0.0174423	0.000488	0.002	0.0031191	0.0056071	326.42796	0.0014262	0.0037182	4,131,948	12.865%
MDV	Diesel	0.0044283	0.0117473	0.1365246	0.0031175	0.0011147	0.008	0.0089528	0.0180675	0.0010664	0.002	0.0031335	0.0061999	329.00609	0.0002057	0.051835	45,544	0.142%
MDV	Electricity	0	0	0	0	0	0.008	0.0044001	0.0124001	0	0.002	0.00154	0.00354	0	0	0	186,791	0.582%
MDV	Plug-in Hybrid	0.0011239	0.0026413	0.172825	0.0011107	0.0002037	0.008	0.0040021	0.0122058	0.0001873	0.002	0.0014007	0.003588	112.34944	0.0003417	0.0004444	122,560	0.382%
MH	Gasoline	0.0114614	0.1963862	0.1585281	0.0192267	0.0014727	0.012	0.0450174	0.0584902	0.0013541	0.003	0.0157561	0.0201102	1944.8378	0.004036	0.0181226	11,674	0.036%
MH	Diesel	0.0862098	2.576505	0.2540272	0.0103064	0.0283879	0.016	0.0447853	0.0891732	0.0271599	0.004	0.0156748	0.0468347	1087.6895	0.0040043	0.1713659	6,730	0.021%
Motor Coach	Diesel	0.0105293	0.9325411	0.0359028	0.0145012	0.0236612	0.012	0.0814729	0.1171341	0.0226376	0.003	0.0285155	0.0541531	1531.3695	0.0004891	0.2412679	4,011	0.012%
OBUS	Gasoline	0.02462	0.2777057	0.4903288	0.0151856	0.0012812	0.012	0.0447987	0.0580799	0.001178	0.003	0.0156795	0.0198576	1536.0679	0.0054995	0.0165529	4,573	0.014%
OBUS	Electricity	0	0	0	0	0	0.012	0.0223994	0.0343994	0	0.003	0.0078398	0.0108398	0	0	0	5,190	0.016%
PTO	Diesel	0.0147593	2.5647613	0.1826767	0.0165735	0.0040723	0	0	0.0040723	0.0038961	0	0	0.0038961	1750.2117	0.0006855	0.2757466	9,261	0.029%
PTO	Electricity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,466	0.026%
SBUS	Gasoline	0.0083844	0.1291335	0.1940946	0.0072857	0.001228	0.008	0.0449171	0.0541451	0.0011291	0.002	0.015721	0.0188501	736.97368	0.0019944	0.0121762	4,991	0.016%
SBUS	Diesel	0.0078703	0.43011	0.058087	0.010006	0.0036115	0.012	0.0449171	0.0605286	0.0034552	0.003	0.015721	0.0221762	1056.6674	0.0003656	0.1664784	5,574	0.017%
SBUS	Electricity	0	0	0	0	0	0.0106252	0.0224586	0.0330838	0	0.0026563	0.0078605	0.0105168	0	0	0	7,025	0.022%
SBUS	Natural Gas	0.0384401	0.2964605	8.1369977	0	0.0036743	0.012	0.0449171	0.0605914	0.0033783	0.003	0.015721	0.0220993	1128.2014	2.6903716	0.2299912	333	0.001%
T6 CAIRP Class 4	Diesel	0.0053749	0.1781381	0.0275472	0.0096198	0.0054093	0.012	0.0423138	0.0597231	0.0051753	0.003	0.0148098	0.0229851	1015.8784	0.0002496	0.1600521	58	0.000%
T6 CAIRP Class 4	Electricity	0	0	0	0	0	0.012	0.0211569	0.0331569	0	0.003	0.0074049	0.0104049	0	0	0	80	0.000%
T6 CAIRP Class 5	Diesel	0.0053867	0.1795849	0.0275971	0.009624	0.0054214	0.012	0.0423138	0.0597353	0.0051869	0.003	0.0148098	0.0229967	1016.3293	0.0002502	0.1601231	80	0.000%
T6 CAIRP Class 5	Electricity	0	0	0	0	0	0.012	0.0211569	0.0331569	0	0.003	0.0074049	0.0104049	0	0	0	110	0.000%
T6 CAIRP Class 6	Diesel	0.0053599	0.1787864	0.0274814	0.0096084	0.0054266	0.012	0.0423138	0.0597404	0.0051918	0.003	0.0148098	0.0230017	1014.6808	0.000249	0.1598634	208	0.001%
T6 CAIRP Class 6	Electricity	0	0	0	0	0	0.012	0.0211569	0.0331569	0	0.003	0.0074049	0.0104049	0	0	0	289	0.001%
T6 CAIRP Class 7	Diesel	0.0057742	0.1953994	0.0296042	0.0084859	0.0057515	0.012	0.0423138	0.0600653	0.0055027	0.003	0.0148098	0.0233125	896.13389	0.0002682	0.1411863	2,380	0.007%
T6 CAIRP Class 7	Electricity	0	0	0	0	0	0.012	0.0211569	0.0331569	0	0.003	0.0074049	0.0104049	0	0	0	739	0.002%
T6 Instate Delivery Class 4	Diesel	0.0061363	0.3699076	0.0540164	0.009945	0.001934	0.012	0.0475629	0.0614969	0.0018503	0.003	0.016647	0.0214973	1050.2269	0.000285	0.1654637	5,851	0.018%
T6 Instate Delivery Class 4	Electricity	0	0	0	0	0	0.012	0.0237815	0.0357815	0	0.003	0.0083235	0.0113235	0	0	0	6,073	0.019%
T6 Instate Delivery Class 4	Natural Gas	0.0124695	0.0603231	3.8169558	0	0.0020138	0.012	0.0475629	0.0615767	0.0018516	0.003	0.016647	0.0214986	1006.7448	0.8727229	0.2052315	78	0.000%
T6 Instate Delivery Class 5	Diesel	0.0061166	0.3654042	0.0537491	0.009968	0.0019263	0.012	0.0475629	0.0614892	0.001843	0.003	0.016647	0.02149	1052.6588	0.0002841	0.1658468	4,753	0.015%
T6 Instate Delivery Class 5	Electricity	0	0	0	0	0	0.012	0.0237815	0.0357815	0	0.003	0.0083235	0.0113235	0	0	0	4,940	0.015%
T6 Instate Delivery Class 5	Natural Gas	0.0124715	0.0600929	3.8175048	0	0.0020151	0.012	0.0475629	0.061578	0.0018528	0.003	0.016647	0.0214998	1005.8654	0.8728632	0.2050522	62	0.000%
T6 Instate Delivery Class 6	Diesel	0.0061745	0.3714455	0.0540212	0.0099553	0.0019403	0.012	0.0475629	0.0615032	0.0018564	0.003	0.016647	0.0215034	1051.3128	0.0002868	0.1656348	10,333	0.032%
T6 Instate Delivery Class 6	Electricity	0	0	0	0	0	0.012	0.0237815	0.0357815	0	0.003	0.0083235	0.0113235	0	0	0	10,742	0.033%

T6 Instate Delivery Class 6	Natural Gas	0.0124641	0.0609431	3.8154774	0	0.0020102	0.012	0.0475629	0.0615732	0.0018483	0.003	0.016647	0.0214954	1006.5513	0.8723451	0.2051921	137	0.000%
T6 Instate Delivery Class 7	Diesel	0.0108905	0.7861263	0.0815582	0.0101938	0.0029678	0.012	0.0475629	0.0625308	0.0028394	0.003	0.016647	0.0224865	1076.4958	0.0005058	0.1696023	2,172	0.007%
T6 Instate Delivery Class 7	Electricity	0	0	0	0	0	0.012	0.0237815	0.0357815	0	0.003	0.0083235	0.0113235	0	0	0	1,256	0.004%
T6 Instate Delivery Class 7	Natural Gas	0.0117678	0.1414364	3.6308079	0	0.0015519	0.012	0.0475629	0.0611148	0.0014269	0.003	0.016647	0.021074	1034.4348	0.8236124	0.2108763	45	0.000%
T6 Instate Other Class 4	Diesel	0.0055291	0.2765935	0.0427715	0.0096245	0.003152	0.012	0.0448637	0.0600158	0.0030157	0.003	0.0157023	0.021718	1016.3806	0.0002568	0.1601312	15,980	0.050%
T6 Instate Other Class 4	Electricity	0	0	0	0	0	0.012	0.0224319	0.0344319	0	0.003	0.0078512	0.0108512	0	0	0	17,676	0.055%
T6 Instate Other Class 4	Natural Gas	0.009963	0.0520674	2.6717096	0	0.0015566	0.012	0.0448637	0.0584203	0.0014312	0.003	0.0157023	0.0201335	878.48354	0.6972956	0.1790846	218	0.001%
T6 Instate Other Class 5	Diesel	0.0055661	0.2756171	0.0427693	0.0096337	0.0031551	0.012	0.0448637	0.0600189	0.0030186	0.003	0.0157023	0.0217209	1017.3546	0.0002585	0.1602846	37,507	0.117%
T6 Instate Other Class 5	Electricity	0	0	0	0	0	0.012	0.0224319	0.0344319	0	0.003	0.0078512	0.0108512	0	0	0	41,479	0.129%
T6 Instate Other Class 5	Natural Gas	0.0099593	0.0523903	2.6720042	0	0.0015547	0.012	0.0448637	0.0584184	0.0014295	0.003	0.0157023	0.0201318	877.19718	0.6970389	0.1788224	503	0.002%
T6 Instate Other Class 6	Diesel	0.005566	0.279844	0.0428505	0.0096279	0.0031701	0.012	0.0448637	0.0600339	0.003033	0.003	0.0157023	0.0217353	1016.7371	0.0002585	0.1601874	28,438	0.089%
T6 Instate Other Class 6	Electricity	0	0	0	0	0	0.012	0.0224319	0.0344319	0	0.003	0.0078512	0.0108512	0	0	0	31,399	0.098%
T6 Instate Other Class 6	Natural Gas	0.0099606	0.0522803	2.6719038	0	0.0015553	0.012	0.0448637	0.0584191	0.0014301	0.003	0.0157023	0.0201324	877.20453	0.6971263	0.1788239	381	0.001%
T6 Instate Other Class 7	Diesel	0.0074317	0.4880791	0.0543921	0.0097581	0.0041265	0.012	0.0448637	0.0609903	0.003948	0.003	0.0157023	0.0226503	1030.4827	0.0003452	0.162353	22,177	0.069%
T6 Instate Other Class 7	Electricity	0	0	0	0	0	0.012	0.0224319	0.0344319	0	0.003	0.0078512	0.0108512	0	0	0	15,181	0.047%
T6 Instate Other Class 7	Natural Gas	0.0094782	0.0957212	2.7201941	0	0.0013039	0.012	0.0448637	0.0581677	0.0011989	0.003	0.0157023	0.0199012	897.02735	0.6633665	0.1828649	471	0.001%
T6 Instate Tractor Class 6	Diesel	0.0054278	0.2695972	0.0419187	0.0096482	0.003114	0.012	0.0448637	0.0599777	0.0029792	0.003	0.0157023	0.0216816	1018.879	0.0002521	0.1605248	302	0.001%
T6 Instate Tractor Class 6	Electricity	0	0	0	0	0	0.012	0.0224319	0.0344319	0	0.003	0.0078512	0.0108512	0	0	0	348	0.001%
T6 Instate Tractor Class 6	Natural Gas	0.0099615	0.0521973	2.6718281	0	0.0015558	0.012	0.0448637	0.0584196	0.0014305	0.003	0.0157023	0.0201328	878.52686	0.6971923	0.1790934	4	0.000%
T6 Instate Tractor Class 7	Diesel	0.0069236	0.4425969	0.051994	0.009013	0.0039106	0.012	0.0448637	0.0607744	0.0037414	0.003	0.0157023	0.0224438	951.79897	0.0003216	0.1499563	4,468	0.014%
T6 Instate Tractor Class 7	Electricity	0	0	0	0	0	0.012	0.0224319	0.0344319	0	0.003	0.0078512	0.0108512	0	0	0	941	0.003%
T6 Instate Tractor Class 7	Natural Gas	0.0094882	0.0948277	2.7192419	0	0.0013091	0.012	0.0448637	0.0581729	0.0012037	0.003	0.0157023	0.019906	880.62758	0.6640646	0.1795217	93	0.000%
T6 OOS Class 4	Diesel	0.0052592	0.2221693	0.0269357	0.00903	0.0055842	0.012	0.0423138	0.0598981	0.0053427	0.003	0.0148098	0.0231525	953.60201	0.0002443	0.1502404	78	0.000%
T6 OOS Class 5	Diesel	0.005282	0.2246809	0.0270241	0.0090375	0.0056053	0.012	0.0423138	0.0599191	0.0053628	0.003	0.0148098	0.0231727	954.3897	0.0002453	0.1503645	107	0.000%
T6 OOS Class 6	Diesel	0.0052307	0.2194254	0.0268172	0.00901	0.0055584	0.012	0.0423138	0.0598722	0.0053179	0.003	0.0148098	0.0231278	951.48303	0.000243	0.1499065	280	0.001%
T6 OOS Class 7	Diesel	0.005648	0.2318964	0.0289595	0.0081202	0.0058938	0.012	0.0423138	0.0602076	0.0056388	0.003	0.0148098	0.0234487	857.52126	0.0002623	0.1351028	2,033	0.006%
T6 Public Class 4	Diesel	0.0160276	0.6653429	0.0660734	0.0103401	0.0046987	0.012	0.0461694	0.0628681	0.0044954	0.003	0.0161593	0.0236547	1091.948	0.0007444	0.1720369	1,647	0.005%
T6 Public Class 4	Electricity	0	0	0	0	0	0.012	0.0230847	0.0350847	0	0.003	0.0080796	0.0110796	0	0	0	1,490	0.005%
T6 Public Class 4	Natural Gas	0.0126218	0.0581353	3.0578162	0	0.0017947	0.012	0.0461694	0.0599641	0.0016502	0.003	0.0161593	0.0208094	977.0832	0.8833823	0.1991848	110	0.000%
T6 Public Class 5	Diesel	0.0138665	0.5547852	0.0622835	0.010391	0.003897	0.012	0.0461694	0.0620664	0.0037284	0.003	0.0161593	0.0228877	1097.3277	0.0006441	0.1728844	3,050	0.009%
T6 Public Class 5	Electricity	0	0	0	0	0	0.012	0.0230847	0.0350847	0	0.003	0.0080796	0.0110796	0	0	0	2,758	0.009%
T6 Public Class 5	Natural Gas	0.0125564	0.0689268	3.0613735	0	0.0017435	0.012	0.0461694	0.0599129	0.001603	0.003	0.0161593	0.0207623	990.74354	0.8788037	0.2019696	228	0.001%
T6 Public Class 6	Diesel	0.0120489	0.511168	0.0571533	0.0103544	0.0037824	0.012	0.0461694	0.0619518	0.0036188	0.003	0.0161593	0.0227781	1093.4552	0.0005596	0.1722743	2,749	0.009%
T6 Public Class 6	Electricity	0	0	0	0	0	0.012	0.0230847	0.0350847	0	0.003	0.0080796	0.0110796	0	0	0	2,466	0.008%
T6 Public Class 6	Natural Gas	0.0125868	0.0639127	3.0597747	0	0.0017673	0.012	0.0461694	0.0599367	0.0016249	0.003	0.0161593	0.0207842	980.7937	0.8809317	0.1999412	189	0.001%
T6 Public Class 7	Diesel	0.0109851	0.4817364	0.0538311	0.0102023	0.0035772	0.012	0.0461694	0.0617466	0.0034225	0.003	0.0161593	0.0225818	1077.398	0.0005102	0.1697445	5,641	0.018%
T6 Public Class 7	Electricity	0	0	0	0	0	0.012	0.0230847	0.0350847	0	0.003	0.0080796	0.0110796	0	0	0	4,133	0.013%
T6 Public Class 7	Natural Gas	0.0125886	0.0636114	3.0598609	0	0.0017687	0.012	0.0461694	0.0599381	0.0016262	0.003	0.0161593	0.0207855	980.74549	0.8810616	0.1999314	398	0.001%
T6 Utility Class 5	Diesel	0.0050943	0.192546	0.035576	0.0096326	0.0023182	0.012	0.0454967	0.0598149	0.0022179	0.003	0.0159238	0.0211418	1017.2384	0.0002366	0.1602663	1,193	0.004%
T6 Utility Class 5	Electricity	0	0	0	0	0	0.012	0.0227484	0.0347484	0	0.003	0.0079619	0.0109619	0	0	0	1,710	0.005%
T6 Utility Class 5	Natural Gas	0.0111369	0.0541674	2.7453396	0	0.0016363	0.012	0.0454967	0.059133	0.0015045	0.003	0.0159238	0.0204284	915.65481	0.7794545	0.1866622	10	0.000%
T6 Utility Class 6	Diesel	0.0050952	0.1883103	0.0355821	0.0096331	0.002301	0.012	0.0454967	0.0597977	0.0022015	0.003	0.0159238	0.0211253	1017.2872	0.0002367	0.160274	226	0.001%
T6 Utility Class 6	Electricity	0	0	0	0	0	0.012	0.0227484	0.0347484	0	0.003	0.0079619	0.0109619	0	0	0	323	0.001%
T6 Utility Class 6	Natural Gas	0.0111369	0.0541674	2.7453396	0	0.0016363	0.012	0.0454967	0.059133	0.0015045	0.003	0.0159238	0.0204284	915.6688	0.7794545	0.1866651	2	0.000%
T6 Utility Class 7	Diesel	0.0050452	0.1834542	0.0352327	0.0096392	0.0022884	0.012	0.0454967	0.0597851	0.0021894	0.003	0.0159238	0.0211132	1017.9341	0.0002343	0.1603759	309	0.001%
T6 Utility Class 7	Electricity	0	0	0	0	0	0.012	0.0227484	0.0347484	0	0.003	0.0079619	0.0109619	0	0	0	454	0.001%
T6 Utility Class 7	Natural Gas	0.0111369	0.0541674	2.7453396	0	0.0016363	0.012	0.0454967	0.059133	0.0015045	0.003	0.0159238	0.0204284	915.67231	0.7794545	0.1866658	3	0.000%
T6TS	Gasoline	0.0110763	0.0694032	0.1841074	0.0152225	0.0014928	0.012	0.0450174	0.0585102	0.0013726	0.003	0.0157561	0.0201287	1539.8019	0.0030193	0.0070168	25,161	0.078%
T6TS	Electricity	0	0	0	0	0	0.012	0.0225087	0.0345087	0	0.003	0.0078781	0.0108781	0	0	0	28,960	0.090%
T7 CAIRP Class 8	Diesel	0.0114677	1.2072941	0.0388014	0.0121027	0.0299	0.036	0.0818327	0.1477327	0.0286066	0.009	0.0286414	0.066248	1278.0825	0.0005326	0.2013624	138,534	0.431%
T7 CAIRP Class 8	Electricity	0	0	0	0	0	0.036	0.0409485	0.0769485	0	0.009	0.014332	0.023332	0	0	0	39,270	0.122%
T7 CAIRP Class 8	Natural Gas	0.0133626	0.1528523	2.8835663	0	0.0019662	0.036	0.0818259	0.1197921	0.0018078	0.009	0.0286391	0.0394469	1022.864	0.935233	0.2085175	254	0.001%
T7 NNOOS Class 8	Diesel	0.0111527	1.3309651	0.0377624	0.0115955	0.0295077	0.036	0.0818184	0.1473261	0.0282312	0.009	0.0286364	0.0658677	1224.5275	0.000518	0.1929248	211,410	0.658%
T7 NOOS Class 8	Diesel	0.0115072	1.3693581	0.0389311	0.0115877	0.0312467	0.036	0.0818402	0.1490869	0.029895	0.009	0.0286441	0.067539	1223.6993	0.0005345	0.1927943	76,819	0.239%
T7 Other Port Class 8	Diesel	0.0100333	1.2320039	0.0634813	0.0129867	0.0164234	0.036	0.0941574	0.1465807	0.0157129	0.009	0.0329551	0.057668	1371.4406	0.000466	0.216071	14,474	0.045%
T7 Other Port Class 8	Electricity	0	0	0	0	0	0.036	0.0470787	0.0830787	0	0.009	0.0164775	0.0254775	0	0	0	3,660	0.011%
T7 POAK Class 8	Diesel	0.0102352	1.2810158	0.0647593	0.0129436	0.0171345	0.036	0.0941574	0.1472919	0.0163933	0.009	0.0329551	0.0583484	1366.8905	0.0004754	0.2153542	50,375	0.157%
T7 POAK Class 8	Electricity	0	0	0	0	0	0.036	0.0470787	0.0830787	0	0.009	0.0164775	0.0254775	0	0	0	11,547	0.036%
T7 POAK Class 8	Natural Gas	0.0167608	0.1726945	4.9769136	0	0.0025243	0.036	0.0941574	0.1326817	0.002321	0.009	0.0329551	0.0442761	1151.7012	1.1730664	0.2347818	114	0.000%
T7 Public Class 8	Diesel	0.0302096	2.0716184	0.1510499	0.0153486	0.0106776	0.036	0.1073291	0.1540067	0.0102157	0.009	0.0375652	0.0567809	1620.8674	0.0014032	0.2553683	13,649	0.042%
T7 Public Class 8	Electricity	0	0	0	0	0	0.036	0.0542879	0.0902879	0	0.009	0.0190008	0.0280008	0	0	0	9,021	0.028%

T7 Public Class 8	Natural Gas	0.0243831	0.2685858	8.0817303	0	0.0032879	0.036	0.1062516	0.1455396	0.0030231	0.009	0.0371881	0.0492112	1461.5566	1.706541	0.2979479	106	0.000%
T7 Single Concrete/Transit Mix Class 8	Diesel	0.008628	0.8048666	0.0436795	0.0137139	0.0137111	0.036	0.0886278	0.1383389	0.013118	0.009	0.0310197	0.0531377	1448.2351	0.0004007	0.22817	2,613	0.008%
T7 Single Concrete/Transit Mix Class 8	Electricity	0	0	0	0	0	0.036	0.0443891	0.0803891	0	0.009	0.0155362	0.0245362	0	0	0	3,633	0.011%
T7 Single Concrete/Transit Mix Class 8	Natural Gas	0.015246	0.1639574	4.0448237	0	0.002255	0.036	0.0886293	0.1268844	0.0020734	0.009	0.0310203	0.0420937	1124.7242	1.0670505	0.2292824	161	0.001%
T7 Single Dump Class 8	Diesel	0.0105433	1.1094634	0.0569782	0.0141188	0.0175577	0.036	0.0869987	0.1405564	0.0167981	0.009	0.0304495	0.0562477	1490.9961	0.0004897	0.234907	18,391	0.057%
T7 Single Dump Class 8	Electricity	0	0	0	0	0	0.036	0.0443695	0.0803695	0	0.009	0.0155293	0.0245293	0	0	0	16,441	0.051%
T7 Single Dump Class 8	Natural Gas	0.0152311	0.2000811	4.5296567	0	0.0021757	0.036	0.0869649	0.1251406	0.0020005	0.009	0.0304377	0.0414382	1152.8841	1.0660067	0.235023	1,137	0.004%
T7 Single Other Class 8	Diesel	0.0096894	1.0087904	0.0502156	0.0139609	0.0166123	0.036	0.0872983	0.1399107	0.0158937	0.009	0.0305544	0.0554481	1474.3125	0.00045	0.2322785	22,936	0.071%
T7 Single Other Class 8	Electricity	0	0	0	0	0	0.036	0.0443738	0.0803738	0	0.009	0.0155308	0.0245308	0	0	0	22,563	0.070%
T7 Single Other Class 8	Natural Gas	0.015241	0.175851	4.2063555	0	0.0022287	0.036	0.0873358	0.1255644	0.0020492	0.009	0.0305675	0.0416167	1135.3124	1.0666967	0.2314409	1,403	0.004%
T7 SWCV Class 8	Diesel	0.03587	5.6393339	0.0923463	0.0374855	0.0149105	0.036	0.2100001	0.2609105	0.0142655	0.009	0.0735	0.0967655	3958.5925	0.0016661	0.6236779	1,867	0.006%
T7 SWCV Class 8	Electricity	0	0	0	0	0	0.036	0.105	0.141	0	0.009	0.03675	0.04575	0	0	0	11,286	0.035%
T7 SWCV Class 8	Natural Gas	0.0133996	0.3485691	10.97397	0	0.0012249	0.036	0.2100001	0.247225	0.0011263	0.009	0.0735	0.0836263	1338.2669	0.7141486	0.2728145	15,575	0.048%
T7 Tractor Class 8	Diesel	0.0103114	1.1909537	0.0483514	0.0121155	0.0219952	0.036	0.0856966	0.1436919	0.0210437	0.009	0.0299938	0.0600376	1279.4315	0.0004789	0.2015749	127,449	0.397%
T7 Tractor Class 8	Electricity	0	0	0	0	0	0.036	0.0432856	0.0792856	0	0.009	0.0151499	0.02415	0	0	0	26,092	0.081%
T7 Tractor Class 8	Natural Gas	0.0145704	0.1816585	3.9810527	0	0.0021165	0.036	0.0855105	0.1236271	0.0019461	0.009	0.0299287	0.0408748	1079.8052	1.0197621	0.2201253	11,110	0.035%
T7 Utility Class 8	Diesel	0.0111927	1.0682666	0.1023557	0.0146562	0.0072636	0.036	0.1010452	0.1443088	0.0069493	0.009	0.0353658	0.0513152	1547.7449	0.0005199	0.2438478	1,305	0.004%
T7 Utility Class 8	Electricity	0	0	0	0	0	0.036	0.0519352	0.0879352	0	0.009	0.0181773	0.0271773	0	0	0	995	0.003%
T7IS	Gasoline	0.4406703	2.1906501	30.050889	0.017883	0.0015577	0.02	0.0965067	0.1180644	0.0014323	0.005	0.0337773	0.0402096	1808.9207	0.095236	0.1015766	87	0.000%
T7IS	Electricity	0	0	0	0	0	0.02	0.0485262	0.0685262	0	0.005	0.0169842	0.0219842	0	0	0	93	0.000%
UBUS	Gasoline	0.0030949	0.0149761	0.5694445	0.0084046	0.0013024	0.008	0.091	0.1003024	0.0011975	0.002	0.03185	0.0350475	850.15021	0.00114	0.0024992	2,864	0.009%
UBUS	Electricity	0	0	0	0	0	0.0288654	0.055	0.0838654	0	0.0072163	0.01925	0.0264663	0	0	0	27,930	0.087%
																TOTAL VMT	32,117,502	100%

lbs/Mile														
ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
1.06E-04	2.29E-03	3.87E-04	2.21E-05	2.93E-05	1.02E-04	2.93E-05	1.57E-04	6.61E-06	3.56E-05	2.80E-05	7.03E-05	2.33E+00	4.94E-06	3.67E-04
2.63E-05	2.34E-04	7.45E-03	0.00E+00	3.51E-06	1.02E-04	3.51E-06	1.32E-04	6.61E-06	3.56E-05	3.22E-06	4.54E-05	2.03E+00	1.84E-03	4.14E-04
6.17E-06	4.34E-05	1.01E-03	4.85E-06	1.09E-06	1.64E-05	1.09E-06	3.51E-05	4.41E-06	5.74E-06	1.00E-06	1.11E-05	4.91E-01	2.13E-06	7.07E-06
9.90E-06	4.09E-05	2.88E-04	3.81E-06	2.81E-06	1.65E-05	2.81E-06	3.69E-05	4.41E-06	5.76E-06	2.69E-06	1.29E-05	4.02E-01	4.60E-07	6.33E-05
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.69E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
2.48E-06	5.83E-06	3.81E-04	2.45E-06	4.47E-07	8.81E-06	4.47E-07	2.69E-05	4.41E-06	3.08E-06	4.11E-07	7.90E-06	2.48E-01	7.55E-07	9.84E-07
6.88E-06	4.76E-05	1.08E-03	5.63E-06	1.20E-06	1.95E-05	1.20E-06	3.83E-05	4.41E-06	6.82E-06	1.10E-06	1.23E-05	5.69E-01	2.32E-06	7.46E-06
2.55E-05	5.90E-05	2.67E-04	7.03E-06	9.01E-06	1.93E-05	9.01E-06	4.59E-05	4.41E-06	6.75E-06	8.62E-06	1.98E-05	7.42E-01	1.18E-06	1.17E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.69E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
2.47E-06	5.81E-06	3.80E-04	2.44E-06	4.30E-07	8.81E-06	4.30E-07	2.69E-05	4.41E-06	3.09E-06	3.95E-07	7.89E-06	2.47E-01	7.56E-07	9.90E-07
8.67E-06	5.07E-05	1.19E-03	5.84E-06	1.13E-06	1.93E-05	1.13E-06	3.81E-05	4.41E-06	6.76E-06	1.04E-06	1.22E-05	5.91E-01	2.87E-06	7.69E-06
2.55E-05	6.05E-05	2.69E-04	5.23E-06	9.06E-06	1.93E-05	9.06E-06	4.60E-05	4.41E-06	6.76E-06	8.67E-06	1.98E-05	5.52E-01	1.19E-06	8.70E-05
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.69E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
2.47E-06	5.82E-06	3.81E-04	2.45E-06	4.39E-07	8.81E-06	4.39E-07	2.69E-05	4.41E-06	3.08E-06	4.04E-07	7.90E-06	2.47E-01	7.56E-07	9.88E-07
9.33E-06	4.84E-05	1.31E-03	1.64E-05	2.81E-06	1.72E-04	2.81E-06	1.92E-04	4.41E-06	6.02E-05	2.58E-06	6.72E-05	1.66E+00	2.77E-06	4.10E-06
2.01E-04	6.66E-04	5.21E-04	1.26E-05	4.33E-05	1.72E-04	4.33E-05	2.42E-04	6.61E-06	6.02E-05	4.15E-05	1.08E-04	1.33E+00	9.36E-06	2.10E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.60E-05	0.00E+00	1.04E-04	4.41E-06	3.01E-05	0.00E+00	3.45E-05	0.00E+00	0.00E+00	0.00E+00
7.94E-06	4.76E-05	1.33E-03	1.84E-05	2.77E-06	2.01E-04	2.77E-06	2.21E-04	4.41E-06	7.02E-05	2.55E-06	7.72E-05	1.86E+00	2.44E-06	4.80E-06
2.50E-04	9.50E-04	6.56E-04	1.48E-05	5.48E-05	2.01E-04	5.48E-05	2.82E-04	6.61E-06	7.02E-05	5.25E-05	1.29E-04	1.56E+00	1.16E-05	2.46E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-04	0.00E+00	1.18E-04	4.41E-06	3.51E-05	0.00E+00	3.95E-05	0.00E+00	0.00E+00	0.00E+00
1.72E-03	1.04E-03	2.17E-02	4.03E-06	4.67E-06	2.65E-05	4.67E-06	3.99E-05	2.20E-06	9.26E-06	4.36E-06	1.58E-05	4.07E-01	2.89E-04	7.82E-05
9.93E-06	5.95E-05	1.26E-03	7.11E-06	1.17E-06	1.96E-05	1.17E-06	3.85E-05	4.41E-06	6.88E-06	1.08E-06	1.24E-05	7.20E-01	3.14E-06	8.20E-06
9.76E-06	2.59E-05	3.01E-04	6.87E-06	2.46E-06	1.97E-05	2.46E-06	3.98E-05	4.41E-06	6.91E-06	2.35E-06	1.37E-05	7.25E-01	4.53E-07	1.14E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E-06	0.00E+00	2.73E-05	4.41E-06	3.40E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
2.48E-06	5.82E-06	3.81E-04	2.45E-06	4.49E-07	8.82E-06	4.49E-07	2.69E-05	4.41E-06	3.09E-06	4.13E-07	7.91E-06	2.48E-01	7.53E-07	9.80E-07
2.53E-05	4.33E-04	3.49E-04	4.24E-05	3.25E-06	9.92E-05	3.25E-06	1.29E-04	6.61E-06	3.47E-05	2.99E-06	4.43E-05	4.29E+00	8.90E-06	4.00E-05
1.90E-04	5.68E-03	5.60E-04	2.27E-05	6.26E-05	9.87E-05	6.26E-05	1.97E-04	8.82E-06	3.46E-05	5.99E-05	1.03E-04	2.40E+00	8.83E-06	3.78E-04
2.32E-05	2.06E-03	7.92E-05	3.20E-05	5.22E-05	1.80E-04	5.22E-05	2.58E-04	6.61E-06	6.29E-05	4.99E-05	1.19E-04	3.38E+00	1.08E-06	5.32E-04
5.43E-05	6.12E-04	1.08E-03	3.35E-05	2.82E-06	9.88E-05	2.82E-06	1.28E-04	6.61E-06	3.46E-05	2.60E-06	4.38E-05	3.39E+00	1.21E-05	3.65E-05
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-05	0.00E+00	7.58E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
3.25E-05	5.65E-03	4.03E-04	3.65E-05	8.98E-06	0.00E+00	8.98E-06	8.98E-06	0.00E+00	0.00E+00	8.59E-06	8.59E-06	3.86E+00	1.51E-06	6.08E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.85E-05	2.85E-04	4.28E-04	1.61E-05	2.71E-06	9.90E-05	2.71E-06	1.19E-04	4.41E-06	3.47E-05	2.49E-06	4.16E-05	1.62E+00	4.40E-06	2.68E-05
1.74E-05	9.48E-04	1.28E-04	2.21E-05	7.96E-06	9.90E-05	7.96E-06	1.33E-04	6.61E-06	3.47E-05	7.62E-06	4.89E-05	2.33E+00	8.06E-07	3.67E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.29E-05	5.86E-06	1.73E-05	0.00E+00	2.32E-05	0.00E+00	0.00E+00	0.00E+00
8.47E-05	6.54E-04	1.79E-02	0.00E+00	8.10E-06	9.90E-05	8.10E-06	1.34E-04	6.61E-06	3.47E-05	7.45E-06	4.87E-05	2.49E+00	5.93E-03	5.07E-04
1.18E-05	3.93E-04	6.07E-05	2.12E-05	1.19E-05	9.33E-05	1.19E-05	1.32E-04	6.61E-06	3.26E-05	1.14E-05	5.07E-05	2.24E+00	5.50E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
1.19E-05	3.96E-04	6.08E-05	2.12E-05	1.20E-05	9.33E-05	1.20E-05	1.32E-04	6.61E-06	3.26E-05	1.14E-05	5.07E-05	2.24E+00	5.52E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
1.18E-05	3.94E-04	6.06E-05	2.12E-05	1.20E-05	9.33E-05	1.20E-05	1.32E-04	6.61E-06	3.26E-05	1.14E-05	5.07E-05	2.24E+00	5.49E-07	3.52E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
1.27E-05	4.31E-04	6.53E-05	1.87E-05	1.27E-05	9.33E-05	1.27E-05	1.32E-04	6.61E-06	3.26E-05	1.21E-05	5.14E-05	1.98E+00	5.91E-07	3.11E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
1.35E-05	8.15E-04	1.19E-04	2.19E-05	4.26E-06	1.05E-04	4.26E-06	1.36E-04	6.61E-06	3.67E-05	4.08E-06	4.74E-05	2.32E+00	6.28E-07	3.65E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.24E-05	0.00E+00	7.89E-05	6.61E-06	1.84E-05	0.00E+00	2.50E-05	0.00E+00	0.00E+00	0.00E+00
2.75E-05	1.33E-04	8.41E-03	0.00E+00	4.44E-06	1.05E-04	4.44E-06	1.36E-04	6.61E-06	3.67E-05	4.08E-06	4.74E-05	2.22E+00	1.92E-03	4.52E-04
1.35E-05	8.06E-04	1.18E-04	2.20E-05	4.25E-06	1.05E-04	4.25E-06	1.36E-04	6.61E-06	3.67E-05	4.06E-06	4.74E-05	2.32E+00	6.26E-07	3.66E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.24E-05	0.00E+00	7.89E-05	6.61E-06	1.84E-05	0.00E+00	2.50E-05	0.00E+00	0.00E+00	0.00E+00
2.75E-05	1.32E-04	8.42E-03	0.00E+00	4.44E-06	1.05E-04	4.44E-06	1.36E-04	6.61E-06	3.67E-05	4.08E-06	4.74E-05	2.22E+00	1.92E-03	4.52E-04
1.36E-05	8.19E-04	1.19E-04	2.19E-05	4.28E-06	1.05E-04	4.28E-06	1.36E-04	6.61E-06	3.67E-05	4.09E-06	4.74E-05	2.32E+00	6.32E-07	3.65E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.24E-05	0.00E+00	7.89E-05	6.61E-06	1.84E-05	0.00E+00	2.50E-05	0.00E+00	0.00E+00	0.00E+00

1.00E-06

2.75E-05	1.34E-04	8.41E-03	0.00E+00	4.43E-06	1.05E-04	4.43E-06	1.36E-04	6.61E-06	3.67E-05	4.07E-06	4.74E-05	2.22E+00	1.92E-03	4.52E-04
2.40E-05	1.73E-03	1.80E-04	2.25E-05	6.54E-06	1.05E-04	6.54E-06	1.38E-04	6.61E-06	3.67E-05	6.26E-06	4.96E-05	2.37E+00	1.12E-06	3.74E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.24E-05	0.00E+00	7.89E-05	6.61E-06	1.84E-05	0.00E+00	2.50E-05	0.00E+00	0.00E+00	0.00E+00
2.59E-05	3.12E-04	8.00E-03	0.00E+00	3.42E-06	1.05E-04	3.42E-06	1.35E-04	6.61E-06	3.67E-05	3.15E-06	4.65E-05	2.28E+00	1.82E-03	4.65E-04
1.22E-05	6.10E-04	9.43E-05	2.12E-05	6.95E-06	9.89E-05	6.95E-06	1.32E-04	6.61E-06	3.46E-05	6.65E-06	4.79E-05	2.24E+00	5.66E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.59E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
2.20E-05	1.15E-04	5.89E-03	0.00E+00	3.43E-06	9.89E-05	3.43E-06	1.29E-04	6.61E-06	3.46E-05	3.16E-06	4.44E-05	1.94E+00	1.54E-03	3.95E-04
1.23E-05	6.08E-04	9.43E-05	2.12E-05	6.96E-06	9.89E-05	6.96E-06	1.32E-04	6.61E-06	3.46E-05	6.65E-06	4.79E-05	2.24E+00	5.70E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.59E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
2.20E-05	1.15E-04	5.89E-03	0.00E+00	3.43E-06	9.89E-05	3.43E-06	1.29E-04	6.61E-06	3.46E-05	3.15E-06	4.44E-05	1.93E+00	1.54E-03	3.94E-04
1.23E-05	6.17E-04	9.45E-05	2.12E-05	6.99E-06	9.89E-05	6.99E-06	1.32E-04	6.61E-06	3.46E-05	6.69E-06	4.79E-05	2.24E+00	5.70E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.59E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
2.20E-05	1.15E-04	5.89E-03	0.00E+00	3.43E-06	9.89E-05	3.43E-06	1.29E-04	6.61E-06	3.46E-05	3.15E-06	4.44E-05	1.93E+00	1.54E-03	3.94E-04
1.64E-05	1.08E-03	1.20E-04	2.15E-05	9.10E-06	9.89E-05	9.10E-06	1.34E-04	6.61E-06	3.46E-05	8.70E-06	4.99E-05	2.27E+00	7.61E-07	3.58E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.59E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
2.09E-05	2.11E-04	6.00E-03	0.00E+00	2.87E-06	9.89E-05	2.87E-06	1.28E-04	6.61E-06	3.46E-05	2.64E-06	4.39E-05	1.98E+00	1.46E-03	4.03E-04
1.20E-05	5.94E-04	9.24E-05	2.13E-05	6.87E-06	9.89E-05	6.87E-06	1.32E-04	6.61E-06	3.46E-05	6.57E-06	4.78E-05	2.25E+00	5.56E-07	3.54E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.59E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
2.20E-05	1.15E-04	5.89E-03	0.00E+00	3.43E-06	9.89E-05	3.43E-06	1.29E-04	6.61E-06	3.46E-05	3.15E-06	4.44E-05	1.94E+00	1.54E-03	3.95E-04
1.53E-05	9.76E-04	1.15E-04	1.99E-05	8.62E-06	9.89E-05	8.62E-06	1.34E-04	6.61E-06	3.46E-05	8.25E-06	4.95E-05	2.10E+00	7.09E-07	3.31E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	7.59E-05	6.61E-06	1.73E-05	0.00E+00	2.39E-05	0.00E+00	0.00E+00	0.00E+00
2.09E-05	2.09E-04	5.99E-03	0.00E+00	2.89E-06	9.89E-05	2.89E-06	1.28E-04	6.61E-06	3.46E-05	2.65E-06	4.39E-05	1.94E+00	1.46E-03	3.96E-04
1.16E-05	4.90E-04	5.94E-05	1.99E-05	1.23E-05	9.33E-05	1.23E-05	1.32E-04	6.61E-06	3.26E-05	1.18E-05	5.10E-05	2.10E+00	5.39E-07	3.31E-04
1.16E-05	4.95E-04	5.96E-05	1.99E-05	1.24E-05	9.33E-05	1.24E-05	1.32E-04	6.61E-06	3.26E-05	1.18E-05	5.11E-05	2.10E+00	5.41E-07	3.31E-04
1.15E-05	4.84E-04	5.91E-05	1.99E-05	1.23E-05	9.33E-05	1.23E-05	1.32E-04	6.61E-06	3.26E-05	1.17E-05	5.10E-05	2.10E+00	5.36E-07	3.30E-04
1.25E-05	5.11E-04	6.38E-05	1.79E-05	1.30E-05	9.33E-05	1.30E-05	1.33E-04	6.61E-06	3.26E-05	1.24E-05	5.17E-05	1.89E+00	5.78E-07	2.98E-04
3.53E-05	1.47E-03	1.46E-04	2.28E-05	1.04E-05	1.02E-04	1.04E-05	1.39E-04	6.61E-06	3.56E-05	9.91E-06	5.21E-05	2.41E+00	1.64E-06	3.79E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-05	0.00E+00	7.73E-05	6.61E-06	1.78E-05	0.00E+00	2.44E-05	0.00E+00	0.00E+00	0.00E+00
2.78E-05	1.28E-04	6.74E-03	0.00E+00	3.96E-06	1.02E-04	3.96E-06	1.32E-04	6.61E-06	3.56E-05	3.64E-06	4.59E-05	2.15E+00	1.95E-03	4.39E-04
3.06E-05	1.22E-03	1.37E-04	2.29E-05	8.59E-06	1.02E-04	8.59E-06	1.37E-04	6.61E-06	3.56E-05	8.22E-06	5.05E-05	2.42E+00	1.42E-06	3.81E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-05	0.00E+00	7.73E-05	6.61E-06	1.78E-05	0.00E+00	2.44E-05	0.00E+00	0.00E+00	0.00E+00
2.77E-05	1.52E-04	6.75E-03	0.00E+00	3.84E-06	1.02E-04	3.84E-06	1.32E-04	6.61E-06	3.56E-05	3.53E-06	4.58E-05	2.18E+00	1.94E-03	4.45E-04
2.66E-05	1.13E-03	1.26E-04	2.28E-05	8.34E-06	1.02E-04	8.34E-06	1.37E-04	6.61E-06	3.56E-05	7.98E-06	5.02E-05	2.41E+00	1.23E-06	3.80E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-05	0.00E+00	7.73E-05	6.61E-06	1.78E-05	0.00E+00	2.44E-05	0.00E+00	0.00E+00	0.00E+00
2.77E-05	1.41E-04	6.75E-03	0.00E+00	3.90E-06	1.02E-04	3.90E-06	1.32E-04	6.61E-06	3.56E-05	3.58E-06	4.58E-05	2.16E+00	1.94E-03	4.41E-04
2.42E-05	1.06E-03	1.19E-04	2.25E-05	7.89E-06	1.02E-04	7.89E-06	1.36E-04	6.61E-06	3.56E-05	7.55E-06	4.98E-05	2.38E+00	1.12E-06	3.74E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-05	0.00E+00	7.73E-05	6.61E-06	1.78E-05	0.00E+00	2.44E-05	0.00E+00	0.00E+00	0.00E+00
2.78E-05	1.40E-04	6.75E-03	0.00E+00	3.90E-06	1.02E-04	3.90E-06	1.32E-04	6.61E-06	3.56E-05	3.59E-06	4.58E-05	2.16E+00	1.94E-03	4.41E-04
1.12E-05	4.24E-04	7.84E-05	2.12E-05	5.11E-06	1.00E-04	5.11E-06	1.32E-04	6.61E-06	3.51E-05	4.89E-06	4.66E-05	2.24E+00	5.22E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.02E-05	0.00E+00	7.66E-05	6.61E-06	1.76E-05	0.00E+00	2.42E-05	0.00E+00	0.00E+00	0.00E+00
2.46E-05	1.19E-04	6.05E-03	0.00E+00	3.61E-06	1.00E-04	3.61E-06	1.30E-04	6.61E-06	3.51E-05	3.32E-06	4.50E-05	2.02E+00	1.72E-03	4.12E-04
1.12E-05	4.15E-04	7.84E-05	2.12E-05	5.07E-06	1.00E-04	5.07E-06	1.32E-04	6.61E-06	3.51E-05	4.85E-06	4.66E-05	2.24E+00	5.22E-07	3.53E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.02E-05	0.00E+00	7.66E-05	6.61E-06	1.76E-05	0.00E+00	2.42E-05	0.00E+00	0.00E+00	0.00E+00
2.46E-05	1.19E-04	6.05E-03	0.00E+00	3.61E-06	1.00E-04	3.61E-06	1.30E-04	6.61E-06	3.51E-05	3.32E-06	4.50E-05	2.02E+00	1.72E-03	4.12E-04
1.11E-05	4.04E-04	7.77E-05	2.13E-05	5.04E-06	1.00E-04	5.04E-06	1.32E-04	6.61E-06	3.51E-05	4.83E-06	4.65E-05	2.24E+00	5.17E-07	3.54E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.02E-05	0.00E+00	7.66E-05	6.61E-06	1.76E-05	0.00E+00	2.42E-05	0.00E+00	0.00E+00	0.00E+00
2.46E-05	1.19E-04	6.05E-03	0.00E+00	3.61E-06	1.00E-04	3.61E-06	1.30E-04	6.61E-06	3.51E-05	3.32E-06	4.50E-05	2.02E+00	1.72E-03	4.12E-04
2.44E-05	1.53E-04	4.06E-04	3.36E-05	3.29E-06	9.92E-05	3.29E-06	1.29E-04	6.61E-06	3.47E-05	3.03E-06	4.44E-05	3.39E+00	6.66E-06	1.55E-05
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-05	0.00E+00	7.61E-05	6.61E-06	1.74E-05	0.00E+00	2.40E-05	0.00E+00	0.00E+00	0.00E+00
2.53E-05	2.66E-03	8.55E-05	2.67E-05	6.59E-05	1.80E-04	6.59E-05	3.26E-04	1.98E-05	6.31E-05	6.31E-05	1.46E-04	2.82E+00	1.17E-06	4.44E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.03E-05	0.00E+00	1.70E-04	1.98E-05	3.16E-05	0.00E+00	5.14E-05	0.00E+00	0.00E+00	0.00E+00
2.95E-05	3.37E-04	6.36E-03	0.00E+00	4.33E-06	1.80E-04	4.33E-06	2.64E-04	1.98E-05	6.31E-05	3.99E-06	8.70E-05	2.26E+00	2.06E-03	4.60E-04
2.46E-05	2.93E-03	8.33E-05	2.56E-05	6.51E-05	1.80E-04	6.51E-05	3.25E-04	1.98E-05	6.31E-05	6.22E-05	1.45E-04	2.70E+00	1.14E-06	4.25E-04
2.54E-05	3.02E-03	8.58E-05	2.55E-05	6.89E-05	1.80E-04	6.89E-05	3.29E-04	1.98E-05	6.31E-05	6.59E-05	1.49E-04	2.70E+00	1.18E-06	4.25E-04
2.21E-05	2.72E-03	1.40E-04	2.86E-05	3.62E-05	2.08E-04	3.62E-05	3.23E-04	1.98E-05	7.27E-05	3.46E-05	1.27E-04	3.02E+00	1.03E-06	4.76E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-04	0.00E+00	1.83E-04	1.98E-05	3.63E-05	0.00E+00	5.62E-05	0.00E+00	0.00E+00	0.00E+00
2.26E-05	2.82E-03	1.43E-04	2.85E-05	3.78E-05	2.08E-04	3.78E-05	3.25E-04	1.98E-05	7.27E-05	3.61E-05	1.29E-04	3.01E+00	1.05E-06	4.75E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-04	0.00E+00	1.83E-04	1.98E-05	3.63E-05	0.00E+00	5.62E-05	0.00E+00	0.00E+00	0.00E+00
3.70E-05	3.81E-04	1.10E-02	0.00E+00	5.57E-06	2.08E-04	5.57E-06	2.93E-04	1.98E-05	7.27E-05	5.12E-06	9.76E-05	2.54E+00	2.59E-03	5.18E-04
6.66E-05	4.57E-03	3.33E-04	3.38E-05	2.35E-05	2.37E-04	2.35E-05	3.40E-04	1.98E-05	8.28E-05	2.25E-05	1.25E-04	3.57E+00	3.09E-06	5.63E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-04	0.00E+00	1.99E-04	1.98E-05	4.19E-05	0.00E+00	6.17E-05	0.00E+00	0.00E+00	0.00E+00

5.38E-05	5.92E-04	1.78E-02	0.00E+00	7.25E-06	2.34E-04	7.25E-06	3.21E-04	1.98E-05	8.20E-05	6.66E-06	1.08E-04	3.22E+00	3.76E-03	6.57E-04
1.90E-05	1.77E-03	9.63E-05	3.02E-05	3.02E-05	1.95E-04	3.02E-05	3.05E-04	1.98E-05	6.84E-05	2.89E-05	1.17E-04	3.19E+00	8.83E-07	5.03E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.79E-05	0.00E+00	1.77E-04	1.98E-05	3.43E-05	0.00E+00	5.41E-05	0.00E+00	0.00E+00	0.00E+00
3.36E-05	3.61E-04	8.92E-03	0.00E+00	4.97E-06	1.95E-04	4.97E-06	2.80E-04	1.98E-05	6.84E-05	4.57E-06	9.28E-05	2.48E+00	2.35E-03	5.05E-04
2.32E-05	2.45E-03	1.26E-04	3.11E-05	3.87E-05	1.92E-04	3.87E-05	3.10E-04	1.98E-05	6.71E-05	3.70E-05	1.24E-04	3.29E+00	1.08E-06	5.18E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.78E-05	0.00E+00	1.77E-04	1.98E-05	3.42E-05	0.00E+00	5.41E-05	0.00E+00	0.00E+00	0.00E+00
3.36E-05	4.41E-04	9.99E-03	0.00E+00	4.80E-06	1.92E-04	4.80E-06	2.76E-04	1.98E-05	6.71E-05	4.41E-06	9.14E-05	2.54E+00	2.35E-03	5.18E-04
2.14E-05	2.22E-03	1.11E-04	3.08E-05	3.66E-05	1.92E-04	3.66E-05	3.08E-04	1.98E-05	6.74E-05	3.50E-05	1.22E-04	3.25E+00	9.92E-07	5.12E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.78E-05	0.00E+00	1.77E-04	1.98E-05	3.42E-05	0.00E+00	5.41E-05	0.00E+00	0.00E+00	0.00E+00
3.36E-05	3.88E-04	9.27E-03	0.00E+00	4.91E-06	1.93E-04	4.91E-06	2.77E-04	1.98E-05	6.74E-05	4.52E-06	9.17E-05	2.50E+00	2.35E-03	5.10E-04
7.91E-05	1.24E-02	2.04E-04	8.26E-05	3.29E-05	4.63E-04	3.29E-05	5.75E-04	1.98E-05	1.62E-04	3.14E-05	2.13E-04	8.73E+00	3.67E-06	1.37E-03
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-04	0.00E+00	3.11E-04	1.98E-05	8.10E-05	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00
2.95E-05	7.68E-04	2.42E-02	0.00E+00	2.70E-06	4.63E-04	2.70E-06	5.45E-04	1.98E-05	1.62E-04	2.48E-06	1.84E-04	2.95E+00	1.57E-03	6.01E-04
2.27E-05	2.63E-03	1.07E-04	2.67E-05	4.85E-05	1.89E-04	4.85E-05	3.17E-04	1.98E-05	6.61E-05	4.64E-05	1.32E-04	2.82E+00	1.06E-06	4.44E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.54E-05	0.00E+00	1.75E-04	1.98E-05	3.34E-05	0.00E+00	5.32E-05	0.00E+00	0.00E+00	0.00E+00
3.21E-05	4.00E-04	8.78E-03	0.00E+00	4.67E-06	1.89E-04	4.67E-06	2.73E-04	1.98E-05	6.60E-05	4.29E-06	9.01E-05	2.38E+00	2.25E-03	4.85E-04
2.47E-05	2.36E-03	2.26E-04	3.23E-05	1.60E-05	2.23E-04	1.60E-05	3.18E-04	1.98E-05	7.80E-05	1.53E-05	1.13E-04	3.41E+00	1.15E-06	5.38E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-04	0.00E+00	1.94E-04	1.98E-05	4.01E-05	0.00E+00	5.99E-05	0.00E+00	0.00E+00	0.00E+00
9.72E-04	4.83E-03	6.63E-02	3.94E-05	3.43E-06	2.13E-04	3.43E-06	2.60E-04	1.10E-05	7.45E-05	3.16E-06	8.86E-05	3.99E+00	2.10E-04	2.24E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-04	0.00E+00	1.51E-04	1.10E-05	3.74E-05	0.00E+00	4.85E-05	0.00E+00	0.00E+00	0.00E+00
6.82E-06	3.30E-05	1.26E-03	1.85E-05	2.87E-06	2.01E-04	2.87E-06	2.21E-04	4.41E-06	7.02E-05	2.64E-06	7.73E-05	1.87E+00	2.51E-06	5.51E-06
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-04	0.00E+00	1.85E-04	1.59E-05	4.24E-05	0.00E+00	5.83E-05	0.00E+00	0.00E+00	0.00E+00

MTens/Mile														
ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
4.82E-08	1.04E-06	1.75E-07	1.00E-08	1.20E-08	4.61E-08	1.33E-08	7.14E-08	3.00E-09	1.61E-08	1.27E-08	3.19E-08	1.06E-03	2.24E-09	1.66E-07
1.19E-08	1.06E-07	3.38E-06	0.00E+00	1.20E-08	4.61E-08	1.59E-09	5.97E-08	3.00E-09	1.61E-08	1.46E-09	2.06E-08	9.21E-04	8.36E-07	1.88E-07
2.80E-09	1.97E-08	4.59E-07	2.20E-09	8.00E-09	7.43E-09	4.94E-10	1.59E-08	2.00E-09	2.60E-09	4.54E-10	5.06E-09	2.23E-04	9.65E-10	3.21E-09
4.49E-09	1.86E-08	1.31E-07	1.73E-09	8.00E-09	7.46E-09	1.28E-09	1.67E-08	2.00E-09	2.61E-09	1.22E-09	5.83E-09	1.82E-04	2.09E-10	2.87E-08
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.39E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
1.12E-09	2.64E-09	1.73E-07	1.11E-09	8.00E-09	4.00E-09	2.03E-10	1.22E-08	2.00E-09	1.40E-09	1.86E-10	3.58E-09	1.12E-04	3.42E-10	4.46E-10
3.12E-09	2.16E-08	4.92E-07	2.55E-09	8.00E-09	8.83E-09	5.45E-10	1.74E-08	2.00E-09	3.09E-09	5.01E-10	5.59E-09	2.58E-04	1.05E-09	3.38E-09
1.15E-08	2.68E-08	1.21E-07	3.19E-09	8.00E-09	8.75E-09	4.09E-09	2.08E-08	2.00E-09	3.06E-09	3.91E-09	8.98E-09	3.37E-04	5.36E-10	5.30E-08
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.39E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
1.12E-09	2.63E-09	1.72E-07	1.11E-09	8.00E-09	4.00E-09	1.95E-10	1.22E-08	2.00E-09	1.40E-09	1.79E-10	3.58E-09	1.12E-04	3.43E-10	4.49E-10
3.93E-09	2.30E-08	5.42E-07	2.65E-09	8.00E-09	8.76E-09	5.14E-10	1.73E-08	2.00E-09	3.07E-09	4.72E-10	5.54E-09	2.68E-04	1.30E-09	3.49E-09
1.16E-08	2.74E-08	1.22E-07	2.37E-09	8.00E-09	8.76E-09	4.11E-09	2.09E-08	2.00E-09	3.07E-09	3.93E-09	9.00E-09	2.51E-04	5.38E-10	3.95E-08
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.39E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
1.12E-09	2.64E-09	1.73E-07	1.11E-09	8.00E-09	4.00E-09	1.99E-10	1.22E-08	2.00E-09	1.40E-09	1.83E-10	3.58E-09	1.12E-04	3.43E-10	4.48E-10
4.23E-09	2.20E-08	5.94E-07	7.45E-09	8.00E-09	7.80E-08	1.27E-09	8.73E-08	2.00E-09	2.73E-08	1.17E-09	3.05E-08	7.54E-04	1.26E-09	1.86E-09
9.14E-08	3.02E-07	2.36E-07	5.73E-09	1.20E-08	7.80E-08	1.97E-08	1.10E-07	3.00E-09	2.73E-08	1.88E-08	4.91E-08	6.05E-04	4.24E-09	9.53E-08
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	3.90E-08	0.00E+00	4.70E-08	2.00E-09	1.37E-08	0.00E+00	1.57E-08	0.00E+00	0.00E+00	0.00E+00
3.60E-09	2.16E-08	6.03E-07	8.36E-09	8.00E-09	9.10E-08	1.26E-09	1.00E-07	2.00E-09	3.19E-08	1.16E-09	3.50E-08	8.45E-04	1.11E-09	2.18E-09
1.13E-07	4.31E-07	2.98E-07	6.70E-09	1.20E-08	9.10E-08	2.49E-08	1.28E-07	3.00E-09	3.19E-08	2.38E-08	5.86E-08	7.07E-04	5.26E-09	1.11E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.55E-08	0.00E+00	5.35E-08	2.00E-09	1.59E-08	0.00E+00	1.79E-08	0.00E+00	0.00E+00	0.00E+00
7.80E-07	4.71E-07	9.83E-06	1.83E-09	4.00E-09	1.20E-08	2.12E-09	1.81E-08	1.00E-09	4.20E-09	1.98E-09	7.18E-09	1.85E-04	1.31E-07	3.55E-08
4.50E-09	2.70E-08	5.74E-07	3.23E-09	8.00E-09	8.91E-09	5.31E-10	1.74E-08	2.00E-09	3.12E-09	4.88E-10	5.61E-09	3.26E-04	1.43E-09	3.72E-09
4.43E-09	1.17E-08	1.37E-07	3.12E-09	8.00E-09	8.95E-09	1.11E-09	1.81E-08	2.00E-09	3.13E-09	1.07E-09	6.20E-09	3.29E-04	2.06E-10	5.18E-08
0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.40E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
1.12E-09	2.64E-09	1.73E-07	1.11E-09	8.00E-09	4.00E-09	2.04E-10	1.22E-08	2.00E-09	1.40E-09	1.87E-10	3.59E-09	1.12E-04	3.42E-10	4.44E-10
1.15E-08	1.96E-07	1.59E-07	1.92E-08	1.20E-08	4.50E-08	1.47E-09	5.85E-08	3.00E-09	1.58E-08	1.35E-09	2.01E-08	1.94E-03	4.04E-09	1.81E-08
8.62E-08	2.58E-06	2.54E-07	1.03E-08	1.60E-08	4.48E-08	2.84E-08	8.92E-08	4.00E-09	1.57E-08	2.72E-08	4.68E-08	1.09E-03	4.00E-09	1.71E-07
1.05E-08	9.33E-07	3.59E-08	1.45E-08	1.20E-08	8.15E-08	2.37E-08	1.17E-07	3.00E-09	2.85E-08	2.26E-08	5.42E-08	1.53E-03	4.89E-10	2.41E-07
2.46E-08	2.78E-07	4.90E-07	1.52E-08	1.20E-08	4.48E-08	1.28E-09	5.81E-08	3.00E-09	1.57E-08	1.18E-09	1.99E-08	1.54E-03	5.50E-09	1.66E-08
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.84E-09	0.00E+00	1.08E-08	0.00E+00	0.00E+00	0.00E+00
1.48E-08	2.56E-06	1.83E-07	1.66E-08	0.00E+00	0.00E+00	4.07E-09	4.07E-09	0.00E+00	0.00E+00	3.90E-09	3.90E-09	1.75E-03	6.86E-10	2.76E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8.38E-09	1.29E-07	1.94E-07	7.29E-09	8.00E-09	4.49E-08	1.23E-09	5.41E-08	2.00E-09	1.57E-08	1.13E-09	1.89E-08	7.37E-04	1.99E-09	1.22E-08
7.87E-09	4.30E-07	5.81E-08	1.00E-08	1.20E-08	4.49E-08	3.61E-09	6.05E-08	3.00E-09	1.57E-08	3.46E-09	2.22E-08	1.06E-03	3.66E-10	1.66E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-08	2.25E-08	0.00E+00	3.31E-08	2.66E-09	7.86E-09	0.00E+00	1.05E-08	0.00E+00	0.00E+00	0.00E+00
3.84E-08	2.96E-07	8.14E-06	0.00E+00	1.20E-08	4.49E-08	3.67E-09	6.06E-08	3.00E-09	1.57E-08	3.38E-09	2.21E-08	1.13E-03	2.69E-06	2.30E-07
5.37E-09	1.78E-07	2.75E-08	9.62E-09	1.20E-08	4.23E-08	5.41E-09	5.97E-08	3.00E-09	1.48E-08	5.18E-09	2.30E-08	1.02E-03	2.50E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
5.39E-09	1.80E-07	2.76E-08	9.62E-09	1.20E-08	4.23E-08	5.42E-09	5.97E-08	3.00E-09	1.48E-08	5.19E-09	2.30E-08	1.02E-03	2.50E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
5.36E-09	1.79E-07	2.75E-08	9.61E-09	1.20E-08	4.23E-08	5.43E-09	5.97E-08	3.00E-09	1.48E-08	5.19E-09	2.30E-08	1.01E-03	2.49E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
5.77E-09	1.95E-07	2.96E-08	8.49E-09	1.20E-08	4.23E-08	5.75E-09	6.01E-08	3.00E-09	1.48E-08	5.50E-09	2.33E-08	8.96E-04	2.68E-10	1.41E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
6.14E-09	3.70E-07	5.40E-08	9.95E-09	1.20E-08	4.76E-08	1.93E-09	6.15E-08	3.00E-09	1.66E-08	1.85E-09	2.15E-08	1.05E-03	2.85E-10	1.65E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.38E-08	0.00E+00	3.58E-08	3.00E-09	8.32E-09	0.00E+00	1.13E-08	0.00E+00	0.00E+00	0.00E+00
1.25E-08	6.03E-08	3.82E-06	0.00E+00	1.20E-08	4.76E-08	2.01E-09	6.16E-08	3.00E-09	1.66E-08	1.85E-09	2.15E-08	1.01E-03	8.73E-07	2.05E-07
6.12E-09	3.65E-07	5.37E-08	9.97E-09	1.20E-08	4.76E-08	1.93E-09	6.15E-08	3.00E-09	1.66E-08	1.84E-09	2.15E-08	1.05E-03	2.84E-10	1.66E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.38E-08	0.00E+00	3.58E-08	3.00E-09	8.32E-09	0.00E+00	1.13E-08	0.00E+00	0.00E+00	0.00E+00
1.25E-08	6.01E-08	3.82E-06	0.00E+00	1.20E-08	4.76E-08	2.02E-09	6.16E-08	3.00E-09	1.66E-08	1.85E-09	2.15E-08	1.01E-03	8.73E-07	2.05E-07
6.17E-09	3.71E-07	5.40E-08	9.96E-09	1.20E-08	4.76E-08	1.94E-09	6.15E-08	3.00E-09	1.66E-08	1.86E-09	2.15E-08	1.05E-03	2.87E-10	1.66E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.38E-08	0.00E+00	3.58E-08	3.00E-09	8.32E-09	0.00E+00	1.13E-08	0.00E+00	0.00E+00	0.00E+00

1.25E-08	6.09E-08	3.82E-06	0.00E+00	1.20E-08	4.76E-08	2.01E-09	6.16E-08	3.00E-09	1.66E-08	1.85E-09	2.15E-08	1.01E-03	8.72E-07	2.05E-07
1.09E-08	7.86E-07	8.16E-08	1.02E-08	1.20E-08	4.76E-08	2.97E-09	6.25E-08	3.00E-09	1.66E-08	2.84E-09	2.25E-08	1.08E-03	5.06E-10	1.70E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.38E-08	0.00E+00	3.58E-08	3.00E-09	8.32E-09	0.00E+00	1.13E-08	0.00E+00	0.00E+00	0.00E+00
1.18E-08	1.41E-07	3.63E-06	0.00E+00	1.20E-08	4.76E-08	1.55E-09	6.11E-08	3.00E-09	1.66E-08	1.43E-09	2.11E-08	1.03E-03	8.24E-07	2.11E-07
5.53E-09	2.77E-07	4.28E-08	9.62E-09	1.20E-08	4.49E-08	3.15E-09	6.00E-08	3.00E-09	1.57E-08	3.02E-09	2.17E-08	1.02E-03	2.57E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.85E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
9.96E-09	5.21E-08	2.67E-06	0.00E+00	1.20E-08	4.49E-08	1.56E-09	5.84E-08	3.00E-09	1.57E-08	1.43E-09	2.01E-08	8.78E-04	6.97E-07	1.79E-07
5.57E-09	2.76E-07	4.28E-08	9.63E-09	1.20E-08	4.49E-08	3.16E-09	6.00E-08	3.00E-09	1.57E-08	3.02E-09	2.17E-08	1.02E-03	2.59E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.85E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
9.96E-09	5.24E-08	2.67E-06	0.00E+00	1.20E-08	4.49E-08	1.55E-09	5.84E-08	3.00E-09	1.57E-08	1.43E-09	2.01E-08	8.77E-04	6.97E-07	1.79E-07
5.57E-09	2.80E-07	4.29E-08	9.63E-09	1.20E-08	4.49E-08	3.17E-09	6.00E-08	3.00E-09	1.57E-08	3.03E-09	2.17E-08	1.02E-03	2.59E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.85E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
9.96E-09	5.23E-08	2.67E-06	0.00E+00	1.20E-08	4.49E-08	1.56E-09	5.84E-08	3.00E-09	1.57E-08	1.43E-09	2.01E-08	8.77E-04	6.97E-07	1.79E-07
7.43E-09	4.88E-07	5.44E-08	9.76E-09	1.20E-08	4.49E-08	4.13E-09	6.10E-08	3.00E-09	1.57E-08	3.95E-09	2.27E-08	1.03E-03	3.45E-10	1.62E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.85E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
9.48E-09	9.57E-08	2.72E-06	0.00E+00	1.20E-08	4.49E-08	1.30E-09	5.82E-08	3.00E-09	1.57E-08	1.20E-09	1.99E-08	8.97E-04	6.63E-07	1.83E-07
5.43E-09	2.70E-07	4.19E-08	9.65E-09	1.20E-08	4.49E-08	3.11E-09	6.00E-08	3.00E-09	1.57E-08	2.98E-09	2.17E-08	1.02E-03	2.52E-10	1.61E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.85E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
9.96E-09	5.22E-08	2.67E-06	0.00E+00	1.20E-08	4.49E-08	1.56E-09	5.84E-08	3.00E-09	1.57E-08	1.43E-09	2.01E-08	8.79E-04	6.97E-07	1.79E-07
6.92E-09	4.43E-07	5.20E-08	9.01E-09	1.20E-08	4.49E-08	3.91E-09	6.08E-08	3.00E-09	1.57E-08	3.74E-09	2.24E-08	9.52E-04	3.22E-10	1.50E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.24E-08	0.00E+00	3.44E-08	3.00E-09	7.85E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
9.49E-09	9.48E-08	2.72E-06	0.00E+00	1.20E-08	4.49E-08	1.31E-09	5.82E-08	3.00E-09	1.57E-08	1.20E-09	1.99E-08	8.81E-04	6.64E-07	1.80E-07
5.26E-09	2.22E-07	2.69E-08	9.03E-09	1.20E-08	4.23E-08	5.58E-09	5.99E-08	3.00E-09	1.48E-08	5.34E-09	2.32E-08	9.54E-04	2.44E-10	1.50E-07
5.28E-09	2.25E-07	2.70E-08	9.04E-09	1.20E-08	4.23E-08	5.61E-09	5.99E-08	3.00E-09	1.48E-08	5.36E-09	2.32E-08	9.54E-04	2.45E-10	1.50E-07
5.23E-09	2.19E-07	2.68E-08	9.01E-09	1.20E-08	4.23E-08	5.56E-09	5.99E-08	3.00E-09	1.48E-08	5.32E-09	2.31E-08	9.51E-04	2.43E-10	1.50E-07
5.65E-09	2.32E-07	2.90E-08	8.12E-09	1.20E-08	4.23E-08	5.89E-09	6.02E-08	3.00E-09	1.48E-08	5.64E-09	2.34E-08	8.58E-04	2.62E-10	1.35E-07
1.60E-08	6.65E-07	6.61E-08	1.03E-08	1.20E-08	4.62E-08	4.70E-09	6.29E-08	3.00E-09	1.62E-08	4.50E-09	2.37E-08	1.09E-03	7.44E-10	1.72E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.31E-08	0.00E+00	3.51E-08	3.00E-09	8.08E-09	0.00E+00	1.11E-08	0.00E+00	0.00E+00	0.00E+00
1.26E-08	5.81E-08	3.06E-06	0.00E+00	1.20E-08	4.62E-08	1.79E-09	6.00E-08	3.00E-09	1.62E-08	1.65E-09	2.08E-08	9.77E-04	8.83E-07	1.99E-07
1.39E-08	5.55E-07	6.23E-08	1.04E-08	1.20E-08	4.62E-08	3.90E-09	6.21E-08	3.00E-09	1.62E-08	3.73E-09	2.29E-08	1.10E-03	6.44E-10	1.73E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.31E-08	0.00E+00	3.51E-08	3.00E-09	8.08E-09	0.00E+00	1.11E-08	0.00E+00	0.00E+00	0.00E+00
1.26E-08	6.89E-08	3.06E-06	0.00E+00	1.20E-08	4.62E-08	1.74E-09	5.99E-08	3.00E-09	1.62E-08	1.60E-09	2.08E-08	9.91E-04	8.79E-07	2.02E-07
1.20E-08	5.11E-07	5.72E-08	1.04E-08	1.20E-08	4.62E-08	3.78E-09	6.20E-08	3.00E-09	1.62E-08	3.62E-09	2.28E-08	1.09E-03	5.60E-10	1.72E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.31E-08	0.00E+00	3.51E-08	3.00E-09	8.08E-09	0.00E+00	1.11E-08	0.00E+00	0.00E+00	0.00E+00
1.26E-08	6.39E-08	3.06E-06	0.00E+00	1.20E-08	4.62E-08	1.77E-09	5.99E-08	3.00E-09	1.62E-08	1.62E-09	2.08E-08	9.81E-04	8.81E-07	2.00E-07
1.10E-08	4.82E-07	5.38E-08	1.02E-08	1.20E-08	4.62E-08	3.58E-09	6.17E-08	3.00E-09	1.62E-08	3.42E-09	2.26E-08	1.08E-03	5.10E-10	1.70E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.31E-08	0.00E+00	3.51E-08	3.00E-09	8.08E-09	0.00E+00	1.11E-08	0.00E+00	0.00E+00	0.00E+00
1.26E-08	6.36E-08	3.06E-06	0.00E+00	1.20E-08	4.62E-08	1.77E-09	5.99E-08	3.00E-09	1.62E-08	1.63E-09	2.08E-08	9.81E-04	8.81E-07	2.00E-07
5.09E-09	1.93E-07	3.56E-08	9.63E-09	1.20E-08	4.55E-08	2.32E-09	5.98E-08	3.00E-09	1.59E-08	2.22E-09	2.11E-08	1.02E-03	2.37E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.27E-08	0.00E+00	3.47E-08	3.00E-09	7.96E-09	0.00E+00	1.10E-08	0.00E+00	0.00E+00	0.00E+00
1.11E-08	5.42E-08	2.75E-06	0.00E+00	1.20E-08	4.55E-08	1.64E-09	5.91E-08	3.00E-09	1.59E-08	1.50E-09	2.04E-08	9.16E-04	7.79E-07	1.87E-07
5.10E-09	1.88E-07	3.56E-08	9.63E-09	1.20E-08	4.55E-08	2.30E-09	5.98E-08	3.00E-09	1.59E-08	2.20E-09	2.11E-08	1.02E-03	2.37E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.27E-08	0.00E+00	3.47E-08	3.00E-09	7.96E-09	0.00E+00	1.10E-08	0.00E+00	0.00E+00	0.00E+00
1.11E-08	5.42E-08	2.75E-06	0.00E+00	1.20E-08	4.55E-08	1.64E-09	5.91E-08	3.00E-09	1.59E-08	1.50E-09	2.04E-08	9.16E-04	7.79E-07	1.87E-07
5.05E-09	1.83E-07	3.52E-08	9.64E-09	1.20E-08	4.55E-08	2.29E-09	5.98E-08	3.00E-09	1.59E-08	2.19E-09	2.11E-08	1.02E-03	2.34E-10	1.60E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.27E-08	0.00E+00	3.47E-08	3.00E-09	7.96E-09	0.00E+00	1.10E-08	0.00E+00	0.00E+00	0.00E+00
1.11E-08	5.42E-08	2.75E-06	0.00E+00	1.20E-08	4.55E-08	1.64E-09	5.91E-08	3.00E-09	1.59E-08	1.50E-09	2.04E-08	9.16E-04	7.79E-07	1.87E-07
1.11E-08	6.94E-08	1.84E-07	1.52E-08	1.20E-08	4.50E-08	1.49E-09	5.85E-08	3.00E-09	1.58E-08	1.37E-09	2.01E-08	1.54E-03	3.02E-09	7.02E-09
0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.25E-08	0.00E+00	3.45E-08	3.00E-09	7.88E-09	0.00E+00	1.09E-08	0.00E+00	0.00E+00	0.00E+00
1.15E-08	1.21E-06	3.88E-08	1.21E-08	3.60E-08	8.18E-08	2.99E-08	1.48E-07	9.00E-09	2.86E-08	2.86E-08	6.62E-08	1.28E-03	5.33E-10	2.01E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.09E-08	0.00E+00	7.69E-08	9.00E-09	1.43E-08	0.00E+00	2.33E-08	0.00E+00	0.00E+00	0.00E+00
1.34E-08	1.53E-07	2.88E-06	0.00E+00	3.60E-08	8.18E-08	1.97E-09	1.20E-07	9.00E-09	2.86E-08	1.81E-09	3.94E-08	1.02E-03	9.35E-07	2.09E-07
1.12E-08	1.33E-06	3.78E-08	1.16E-08	3.60E-08	8.18E-08	2.95E-08	1.47E-07	9.00E-09	2.86E-08	2.82E-08	6.59E-08	1.22E-03	5.18E-10	1.93E-07
1.15E-08	1.37E-06	3.89E-08	1.16E-08	3.60E-08	8.18E-08	3.12E-08	1.49E-07	9.00E-09	2.86E-08	2.99E-08	6.75E-08	1.22E-03	5.34E-10	1.93E-07
1.00E-08	1.23E-06	6.35E-08	1.30E-08	3.60E-08	9.42E-08	1.64E-08	1.47E-07	9.00E-09	3.30E-08	1.57E-08	5.77E-08	1.37E-03	4.66E-10	2.16E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.71E-08	0.00E+00	8.31E-08	9.00E-09	1.65E-08	0.00E+00	2.55E-08	0.00E+00	0.00E+00	0.00E+00
1.02E-08	1.28E-06	6.48E-08	1.29E-08	3.60E-08	9.42E-08	1.71E-08	1.47E-07	9.00E-09	3.30E-08	1.64E-08	5.83E-08	1.37E-03	4.75E-10	2.15E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.71E-08	0.00E+00	8.31E-08	9.00E-09	1.65E-08	0.00E+00	2.55E-08	0.00E+00	0.00E+00	0.00E+00
1.68E-08	1.73E-07	4.98E-06	0.00E+00	3.60E-08	9.42E-08	2.52E-09	1.33E-07	9.00E-09	3.30E-08	2.32E-09	4.43E-08	1.15E-03	1.17E-06	2.35E-07
3.02E-08	2.07E-06	1.51E-07	1.53E-08	3.60E-08	1.07E-07	1.07E-08	1.54E-07	9.00E-09	3.76E-08	1.02E-08	5.68E-08	1.62E-03	1.40E-09	2.55E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	5.43E-08	0.00E+00	9.03E-08	9.00E-09	1.90E-08	0.00E+00	2.80E-08	0.00E+00	0.00E+00	0.00E+00

2.44E-08	2.69E-07	8.08E-06	0.00E+00	3.60E-08	1.06E-07	3.29E-09	1.46E-07	9.00E-09	3.72E-08	3.02E-09	4.92E-08	1.46E-03	1.71E-06	2.98E-07
8.63E-09	8.05E-07	4.37E-08	1.37E-08	3.60E-08	8.86E-08	1.37E-08	1.38E-07	9.00E-09	3.10E-08	1.31E-08	5.31E-08	1.45E-03	4.01E-10	2.28E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.44E-08	0.00E+00	8.04E-08	9.00E-09	1.55E-08	0.00E+00	2.45E-08	0.00E+00	0.00E+00	0.00E+00
1.52E-08	1.64E-07	4.04E-06	0.00E+00	3.60E-08	8.86E-08	2.26E-09	1.27E-07	9.00E-09	3.10E-08	2.07E-09	4.21E-08	1.12E-03	1.07E-06	2.29E-07
1.05E-08	1.11E-06	5.70E-08	1.41E-08	3.60E-08	8.70E-08	1.76E-08	1.41E-07	9.00E-09	3.04E-08	1.68E-08	5.62E-08	1.49E-03	4.90E-10	2.35E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.44E-08	0.00E+00	8.04E-08	9.00E-09	1.55E-08	0.00E+00	2.45E-08	0.00E+00	0.00E+00	0.00E+00
1.52E-08	2.00E-07	4.53E-06	0.00E+00	3.60E-08	8.70E-08	2.18E-09	1.25E-07	9.00E-09	3.04E-08	2.00E-09	4.14E-08	1.15E-03	1.07E-06	2.35E-07
9.69E-09	1.01E-06	5.02E-08	1.40E-08	3.60E-08	8.73E-08	1.66E-08	1.40E-07	9.00E-09	3.06E-08	1.59E-08	5.54E-08	1.47E-03	4.50E-10	2.32E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.44E-08	0.00E+00	8.04E-08	9.00E-09	1.55E-08	0.00E+00	2.45E-08	0.00E+00	0.00E+00	0.00E+00
1.52E-08	1.76E-07	4.21E-06	0.00E+00	3.60E-08	8.73E-08	2.23E-09	1.26E-07	9.00E-09	3.06E-08	2.05E-09	4.16E-08	1.14E-03	1.07E-06	2.31E-07
3.59E-08	5.64E-06	9.23E-08	3.75E-08	3.60E-08	2.10E-07	1.49E-08	2.61E-07	9.00E-09	7.35E-08	1.43E-08	9.68E-08	3.96E-03	1.67E-09	6.24E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	1.05E-07	0.00E+00	1.41E-07	9.00E-09	3.68E-08	0.00E+00	4.58E-08	0.00E+00	0.00E+00	0.00E+00
1.34E-08	3.49E-07	1.10E-05	0.00E+00	3.60E-08	2.10E-07	1.22E-09	2.47E-07	9.00E-09	7.35E-08	1.13E-09	8.36E-08	1.34E-03	7.14E-07	2.73E-07
1.03E-08	1.19E-06	4.84E-08	1.21E-08	3.60E-08	8.57E-08	2.20E-08	1.44E-07	9.00E-09	3.00E-08	2.10E-08	6.00E-08	1.28E-03	4.79E-10	2.02E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.33E-08	0.00E+00	7.93E-08	9.00E-09	1.51E-08	0.00E+00	2.41E-08	0.00E+00	0.00E+00	0.00E+00
1.46E-08	1.82E-07	3.98E-06	0.00E+00	3.60E-08	8.55E-08	2.12E-09	1.24E-07	9.00E-09	2.99E-08	1.95E-09	4.09E-08	1.08E-03	1.02E-06	2.20E-07
1.12E-08	1.07E-06	1.02E-07	1.47E-08	3.60E-08	1.01E-07	7.26E-09	1.44E-07	9.00E-09	3.54E-08	6.95E-09	5.13E-08	1.55E-03	5.20E-10	2.44E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	5.19E-08	0.00E+00	8.79E-08	9.00E-09	1.82E-08	0.00E+00	2.72E-08	0.00E+00	0.00E+00	0.00E+00
4.41E-07	2.19E-06	3.01E-05	1.79E-08	2.00E-08	9.65E-08	1.56E-09	1.18E-07	5.00E-09	3.38E-08	1.43E-09	4.02E-08	1.81E-03	9.52E-08	1.02E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-08	4.85E-08	0.00E+00	6.85E-08	5.00E-09	1.70E-08	0.00E+00	2.20E-08	0.00E+00	0.00E+00	0.00E+00
3.09E-09	1.50E-08	5.69E-07	8.40E-09	8.00E-09	9.10E-08	1.30E-09	1.00E-07	2.00E-09	3.19E-08	1.20E-09	3.50E-08	8.50E-04	1.14E-09	2.50E-09
0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.89E-08	5.50E-08	0.00E+00	8.39E-08	7.22E-09	1.93E-08	0.00E+00	2.65E-08	0.00E+00	0.00E+00	0.00E+00

State reduction scenario

VMT Type	2019	2030	2040	2045
Light-duty gasoline	1,029,579,767	1,134,641,091	1,191,874,813	1,228,502,857
Light-duty diesel	6,439,790	4,696,735	3,795,249	3,789,535
Light-duty CNG	0	0	0	0
Light-duty electricity	18,031,951	94,466,147	130,043,877	138,533,717
Heavy-duty gasoline	26,084,563	26,198,224	19,728,553	17,706,810
Heavy-duty diesel	55,689,893	59,320,637	53,452,166	53,160,903
Heavy-duty CNG	1,070,505	1,881,874	1,664,144	1,534,115
Heavy-duty electricity	14,621	6,764,503	30,401,259	39,227,543

After Strategy 9 (VMT reductions distributed proportionately by type)

VMT Type	2019	2030	2040	2045
Light-duty gasoline	1,029,579,767	1,089,828,607	1,111,050,306	1,101,656,807
Light-duty diesel	6,439,790	4,511,238	3,537,882	3,398,255
Light-duty CNG	0	0	0	0
Light-duty electricity	18,031,951	90,735,220	121,225,222	124,229,758
Heavy-duty gasoline	26,084,563	25,163,529	18,390,703	15,878,537
Heavy-duty diesel	55,689,893	56,977,777	49,827,418	47,671,904
Heavy-duty CNG	1,070,505	1,807,549	1,551,294	1,375,714
Heavy-duty electricity	14,621	6,497,340	28,339,661	35,177,199

After Strategy 10 (EV conversions distributed proportionately by type)

VMT Type	2019	2030	2040	2045
Light-duty gasoline	1,029,579,767	768,136,085	435,088,238	192,431,446
Light-duty diesel	6,439,790	3,179,623	1,385,437	593,589
Light-duty CNG	0	0	0	0
Light-duty electricity	18,031,951	413,759,356	799,339,734	1,036,259,785
Heavy-duty gasoline	26,084,563	24,368,590	18,081,620	6,361,852
Heavy-duty diesel	55,689,893	55,177,797	48,989,995	19,100,097
Heavy-duty CNG	1,070,505	1,750,447	1,525,222	551,190
Heavy-duty electricity	14,621	9,149,361	29,512,238	74,090,216

Vehicle fuel usage

Fuel Type	Existing Baseline Year 2019	Project Year 2045	Net Change from Existing Baseline
Gasoline			
VMT	1,055,664,330	198,793,298	-856,871,032
Gallons	46,151,714	6,219,583	-39,932,132
Miles per gallon	22.87	31.96	9.09
Diesel			
VMT	62,129,682	19,693,685	-42,435,997
Gallons	7,412,023	2,129,844	-5,282,178
Miles per gallon	8.38	9.25	0.86
Compressed Natural Gas			
VMT	1,070,505	551,190	-519,316
Gallons	213,066	95,605	-117,461
Miles per gallon	5.02	5.77	0.74
Electricity			
VMT	18,046,572	1,110,350,001	1,092,303,429
kWh	6,503,224	539,203,303	532,700,078
Miles per kWh	2.78	2.06	-0.72
Total VMT	**1,136,911,090**	**1,329,388,174**	**192,477,084**

We Can Model Regional Emissions, But Are the Results Meaningful for CEQA?

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On December 24, 2018, the California Supreme Court, *Sierra Club v. County of Fresno (Friant Ranch, L.P.] (2018) 6 Cal.5th 502, Case No. S219783 (Friant Ranch*), held that simply identifying that a project exceeds an emissions threshold is not sufficient to identify a project's significant effect on the environment relative to the health effects of project emissions. The Court found that an EIR should make a reasonable effort to substantively connect a project's criteria pollutant emissions to likely health consequences, or explain why it is not currently feasible to provide such an analysis. In 2019, there were several CEQA documents that included health effects modeling to provide additional analysis for projects with criteria air pollutant emissions that exceed a significance threshold. While it is technically possible to conduct this modeling, we argue that this additional layer of quantitative analysis may not always provide decision-makers and the public with additional meaningful information. It is the air districts that are best suited to provide frameworks for how to identify health effects of regional criteria pollutant emissions under CEQA.

Introduction

Significance thresholds for regional criteria pollutants used by California air districts and lead agencies represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable national or state ambient air quality standard (AAQS). By analyzing the project's emissions against these thresholds, the CEQA document assesses whether these emissions directly contribute to any regional or local exceedances of the applicable AAQS and exposure levels. The basis of the ruling in Friant Ranch was that the EIR did not provide a meaningful analysis of the adverse health effects that would be associated with the project's criteria pollutant emissions, which were identified as being far above the relevant thresholds. The discussion of the adverse health effects in the EIR was general in nature and did not connect the levels of the pollutants that would be emitted by the project to adverse health effects.

The process of correlating project-related criteria pollutant emissions to health-based consequences is called a health impact assessment (HIA). An HIA involves two steps: 1) running a regional photochemical grid model (PGM) to estimate the small increases in concentrations of ozone and particulate matter (PM) in the region as a result of a project's emissions of criteria and precursor pollutants; and 2) running the U.S. EPA Benefits Mapping and Analysis Program (BenMAP) to estimate the resulting health impacts from these increases in concentrations of ozone and PM.

Limitations of Regional-Scale Dispersion Models

It is technically feasible to conduct regional-scale criteria pollutant modeling for a development project. Particulate matter (PM) can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur oxides (SO_x) and NO_x, Ozone (O_3) is a secondary pollutant formed from the oxidation of reactive organic gases (ROGs) and nitrogen oxides (NOx) in the presence of sunlight. Rates of ozone formation are a function of a variety of complex physical factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns.. Secondary formation of PM and ozone can occur far from the original emissions source from regional transport due to wind and topography (e.g. low-level jet stream). As such, modeling concentrations of secondary PM and ozone require photochemical grid models (PGMs), such as CMAQ and CAMx. These models have a much larger "grid" system and much lower resolution than localized dispersion modeling (e.g., AERMOD). For example, common grid cells in PGMs are 4x4 kilometers, while AERMOD can identify concentrations at the meter-level.

Photochemical modeling also depends on all emission sources in the entire domain. Low resolution and spatial averaging produces "noise" and model uncertainty that can exceed a project's specific emissions. Additionally, regional-scale models are highly contingent upon background concentrations. Factors such as meteorology and topography greatly affect the certainty levels of predicted concentrations at receptor points. As a result, there are statistical ranges of uncertainty through all the modeling steps. Due to these factors, it is difficult to predict ground-level secondary PM and ozone concentrations associated with relatively small emission sources with a high degree of certainty. While it is possible to use a regional-scale model to predict these regional concentrations, when a project's emissions are less than the regional model's resolution, the resultant ambient air quality concentrations will be within the margin of uncertainty. In CEQA terms, this would fit the definition of "speculative". Only when the scale of emissions would result in changes in ambient air quality beyond the model margin of uncertainty would the results not be "speculative" as defined by CEQA.

Identifying Health Effects due to Ambient Air Quality Changes

BenMap is a model developed by the USEPA to understand the health effects from changes in ozone and PM concentrations. If there is an acceptable level of confidence that the results provided by the regional dispersion modeling are valid, then these concentrations can be translated into health outcomes using BenMap. The health outcomes in BenMap are based on changes in ambient air concentrations and the population exposed to these changes. Data provided by this analysis may indicate increased number of workdays lost to illness, hospital admissions (respiratory), emergency room visits (asthma), or mortality, among other health effects. These are called "health incidences."

Translating the incremental increase in PM and ozone concentrations to specific health effects is also subject to uncertainty. For example, regional models assign the same toxicity to PM regardless of the source of PM (such as road dust as exhaust), and thus potentially overpredict adverse health effects of PM. BenMap also assumes that health effects can occur at any concentration, including small incremental concentrations, and assumes that impacts seen at large concentration differences can be linearly scaled down to small increases in concentration, with no consideration of potential thresholds below which health impacts may not occur. Additionally, BenMap is used for assessing impacts over large areas and populations and was not intended to be used for individual projects. For health incidences, the number of hospitalizations or increase in morbidity predicted by BenMap is greatly affected by the population characteristics.[1] Small increases in emissions in an area with a high population have a much greater affect than large increases in emissions over an area with a small population. As a result, the same amount of emissions generated in an urban area could result in greater health consequences than if the same emissions occurred on the urban periphery, where fewer people may be affected. This will also depend on other factors including meteorology and photochemistry, as discussed above. Emissions in areas with conditions that favor high air dispersion or unfavorable ozone formation will likely have relatively lower effects on ambient air quality and health outcomes.

While BenMap provides additional statistical information about health consequences requested by the Court in the Friant Ranch decision, this information is only meaningful when presented with the full health context of the region or locality at hand. For example, if the BenMap analysis says that the project would result in two additional hospital admissions, this result alone is not useful unless one identifies how many hospital admissions are caused by poor air quality now (without the project) and how many hospital admissions occur

[1] BenMap assigns prevalence rate for asthma and other health effects based on indicators such as gender, race, age, ethnicity, etc. The BenMap user manual specifically states that there are a wide range of variables that can be included in the health effect function. The health effect function was developed based on epidemiological studies, and specifically states that "there are a number of issues that arise when deriving and choosing between health effect functions that go well beyond this user manual. Hence, it is important to have a trained health researcher assist in developing the impact function data file."

overall (due to air quality and other causes). Because health is not solely influenced by ambient air quality, and has many factors that are highly variable across geographies and populations, there is an added level of uncertainty in using a generalized identification of health effects due to air quality conditions overlaid onto a specific diverse set of health conditions and other factors. Regardless of the uncertainty levels, if regional health effects are identified for a project, then the CEQA analysis needs to provide a full health baseline for decision-makers and the public to be able to understand the marginal change due to project criteria pollutant emissions. Given the margin of uncertainty at each step in the process (regional scale modeling, existing ambient air quality effects on health, population health conditions vulnerability, and marginal health effects of air pollution), the identification of marginal health effects due to individual projects using regional air quality modelling and tools such as BenMap are likely to be within the level of uncertainty and thus defined as "speculative" per CEQA.

The Role of Air Districts

Regional, community, multiscale air quality modeling conducted by the air districts for each individual air basin or locality within the air basin would be the most appropriate indictor of health effects for projects. The AQMPs provide a forecast of regional emissions based on regional dispersion modeling for all sources within the air basin. Regional-scale models attempt to account for all emissions sources within an air basin.

The regional scale model requires inputs such as existing and future regional sources of pollutants and global meteorological data, which are generally not accessible by CEQA practitioners. Modeling of future years should consider future concentrations of air pollutants based on regional growth projections and existing programs, rules, and regulations adopted by Federal, State, and local air districts. In general, air pollution in California is decreasing as a result of Federal and State laws. Based on the air quality management plans (AQMPs) required for air districts in a nonattainment area, air quality in the air basins are anticipated to improve despite an increase in population and employment growth. Air districts are charged with assessing programs, rules, and regulations so that the increase in population and employment does not conflict with the mandate to achieve the AAQS. Because emissions forecasting and health outcomes based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should also fall on the air districts to identify the potential health outcomes associated with individual project's criteria pollutant emissions.

The South Coast Air Quality Management District (South Coast AQMD) and the Sacramento Metropolitan Air Quality Management District (Sacramento Metropolitan AQMD) are exploring concepts for project-level analysis in light of Friant Ranch to assist local lead agencies.

» South Coast AQMD is looking at the largest land use development project they have had in the air basin and doing a sensitivity analysis (using CAMx for photochemical grid modeling and BenMap for health outcomes) to see how locating a very large project in different parts of the air basin (Los Angeles, Inland Empire, v. Orange County) would affect the health incidence.

» Sacramento Metropolitan AQMD is also looking at a screening process. Rather than looking at the upper end (i.e., largest project in the air basin), Sacramento Metropolitan AQMD is starting at the smallest project that exceeds the regional significance threshold and running CAMx and BenMap at different locations in the air basin to see how it affects regional health incidences.

Guidance from Air Districts would be the most effective way to incorporate meaningful information concerning regional health effects of project criteria pollutants in CEQA analyses, including guidance as to when modelling is and is not useful and meaningful, how modelling should be conducted, and how to best present additional information to inform decision-makers and the public about a project's impacts.

So…until air districts do their part, what should we do?

PROJECTS WITH CRITERIA POLLUTANT EMISSIONS BELOW AIR DISTRICT THRESHOLDS

The Friant Ranch ruling was about providing disclosure of health effects of project emissions that were well over the significance thresholds. Since the air district thresholds are tied to a level the air districts find to not have a significant effect on ambient air quality, there should be no need to discuss the health effects of criteria pollutant emissions that are less than the significance thresholds.

PROJECTS WITH CRITERIA POLLUTANT EMISSIONS ABOVE AIR DISTRICT THRESHOLDS

Pursuant to Section 15125 of the CEQA Guidelines, the environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. For CEQA, the health effects associated with buildout of a project would occur at the project's horizon year. Because CEQA requires an analysis of the change from existing conditions, the change in effects would be associated with changes in ambient air quality and associated health outcomes between existing conditions and the project's horizon year. Therefore, in order to show how a project affects health outcomes in an air basin, the CEQA documents will need to qualitatively or quantitatively address: (1) existing ambient criteria pollutant concentrations, health incidences due to existing air quality, and health incidences overall; 2) future (without project) ambient criteria pollutant concentrations and health incidences, and 3) future (with project) ambient criteria pollutant concentrations and health incidences.

Projects with significant criteria pollutant emissions could use regional modelling and BenMap to identify health effects of project emissions, but it is likely that many (or most) projects that are not regionally substantial in scale will be shown to have minimal regional changes in PM and ozone concentrations and therefore minimal changes in associated health effects. In addition, many projects may have emissions that are less than the uncertainty level of regional air quality models and BenMap health effects modeling; in these cases, quantitative results will not be meaningful. Thus, absent better direction from air districts, CEQA lead agencies will have to determine on a case by case basis whether a qualitative discussion of health effects will suffice, or whether regional modeling, despite its limitations, should be conducted for the project.

Where a project has substantial criteria pollutant emissions when considered on a regional scale, and there is reason to believe that the modeling of ambient air quality and regional health effects would produce non-speculative results when considering modeling uncertainties, then CEQA lead agencies should use regional modelling.

Conclusion

The purpose of CEQA is to inform the public as to the potential for a project to result in one or more significant adverse effects on the environment (including health effects). A CEQA document must provide an understandable and clear environmental analysis and provide an adequate basis for decision making and public disclosure. Regional dispersion modeling of criteria pollutants and secondary pollutants like PM and ozone can provide additional information, but that information may be within the margin of modelling uncertainty and/or may not be meaningful for the public and decision-makers unless a full health context is presented in the CEQA document. Simply providing health outcomes based on use of a regional-scale model and BenMap may not satisfy the goal to provide decision-makers and the public with information that would assist in weighting the environmental consequences of a project. A CEQA document must provide an analysis that is understandable for decision making and public disclosure. Regional scale modeling may provide a technical method for this type of analysis, but it does not necessarily provide a meaningful way to connect the magnitude of a project's criteria pollutant emissions to health effects without speculation.

In order to accurately connect the dots, we urge California air districts to provide more guidance on how to identify and describe the health effects of exceeding regional criteria pollutant thresholds. The air districts are the primary agency responsible for ensuring that the air basins attain the AAQS and ensure the health and welfare of its residents relative to air quality. Because emissions forecasting and health outcomes are based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should fall on the air districts to identify the potential health outcomes associated with exceeding the CEQA thresholds for projects. The air districts should provide lead agencies with a consistent, reliable, and meaningful analytical approach to correlate specific health effects that may result from a project's criteria pollutant emissions.

Glossary

AAQS – Ambient Air Quality Standards

BenMap – Benefits Mapping and Analysis Program

CAMx – Comprehensive Air Quality Model with extensions

CMAQ – Community Multiscale Air Quality

NOx – Nitrogen Oxides

PM – Particulate Matter

SOx – Sulfur Oxides

State – California

USEPA – United States Environmental Protection Agency

S219783

IN THE SUPREME COURT OF C ALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,

Plaintiffs and Appellants,

v.

COUNTY OF FRESNO,

Defendant and Respondent,

and,

FRIANT RANCH, L.P.,

Real Party in Interest and Respondent.

SUPREME COURT
FILED
APR 13 2015
Frank A. McGuire Clerk
Deputy

After a Published Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726
Honorable Rosendo A. Pena, Jr.

APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND *[PROPOSED]* BRIEF OF *AMICUS CURIAE*

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RECEIVED
APR - 6 2015
CLERK SUPREME COURT

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TO THE HONORABLE CHIEF JUSTICE AND JUSTICES OF THE SUPREME COURT:

APPLICATION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF

Pursuant to Rule 8.520(f) of the California Rules of Court, the South Coast Air Quality Management District (SCAQMD) respectfully requests leave to file the attached *amicus curiae* brief. Because SCAQMD's position differs from that of either party, we request leave to submit this amicus brief in support of neither party.

HOW THIS BRIEF WILL ASSIST THE COURT

SCAQMD's proposed amicus brief takes a position on two of the issues in this case. In both instances, its position differs from that of either party. The issues are:

1) Does the California Environmental Quality Act (CEQA) require an environmental impact report (EIR) to correlate a project's air pollution emissions with specific levels of health impacts?
2) What is the proper standard of review for determining whether an EIR provides sufficient information on the health impacts caused by a project's emission of air pollutants?

This brief will assist the Court by discussing the practical realities of correlating identified air quality impacts with specific health outcomes. In short, CEQA requires agencies to provide detailed information about a project's air quality impacts that is sufficient for the public and decisionmakers to adequately evaluate the project and meaningfully understand its impacts. However, the level of analysis is governed by a rule of reason; CEQA only requires agencies to conduct analysis if it is reasonably feasible to do so.

With regard to health-related air quality impacts, an analysis that correlates a project's air pollution emissions with specific levels of health impacts will be feasible in some cases but not others. Whether it is feasible depends on a variety of factors, including the nature of the project and the nature of the analysis under consideration. The feasibility of analysis may also change over time as air districts and others develop new tools for measuring projects' air quality related health impacts. Because SCAQMD has among the most sophisticated air quality modeling and health impact evaluation capability of any of the air districts in the State, it is uniquely situated to express an opinion on the extent to which the Court should hold that CEQA requires lead agencies to correlate air quality impacts with specific health outcomes.

SCAQMD can also offer a unique perspective on the question of the appropriate standard of review. SCAQMD submits that the proper standard of review for determining whether an EIR is sufficient as an informational document is more nuanced than argued by either party. In our view, this is a mixed question of fact and law. It includes determining whether additional analysis is feasible, which is primarily a factual question that should be reviewed under the substantial evidence standard. However, it also involves determining whether the omission of a particular analysis renders an EIR insufficient to serve CEQA's purpose as a meaningful, informational document. If a lead agency has not determined that a requested analysis is infeasible, it is the court's role to determine whether the EIR nevertheless meets CEQA's purposes, and courts should not defer to the lead agency's conclusions regarding the legal sufficiency of an EIR's analysis. The ultimate question of whether an EIR's analysis is "sufficient" to serve CEQA's informational purposes is predominately a question of law that courts should review de novo.

This brief will explain the rationale for these arguments and may assist the Court in reaching a conclusion that accords proper respect to a lead agency's factual conclusions while maintaining judicial authority over the ultimate question of what level of analysis CEQA requires.

STATEMENT OF INTEREST OF *AMICUS CURIAE*

The SCAQMD is the regional agency primarily responsible for air pollution control in the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of the Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410; Cal. Code Regs., tit. 17, § 60104.) The SCAQMD participates in the CEQA process in several ways. Sometimes it acts as a lead agency that prepares CEQA documents for projects. Other times it acts as a responsible agency when it has permit authority over some part of a project that is undergoing CEQA review by a different lead agency. Finally, SCAQMD also acts as a commenting agency for CEQA documents that it receives because it is a public agency with jurisdiction by law over natural resources affected by the project.

In all of these capacities, SCAQMD will be affected by the decision in this case. SCAQMD sometimes submits comments requesting that a lead agency perform an additional type of air quality or health impacts analysis. On the other hand, SCAQMD sometimes determines that a particular type of health impact analysis is not feasible or would not produce reliable and informative results. Thus, SCAQMD will be affected by the Court's resolution of the extent to which CEQA requires EIRs to correlate emissions and health impacts, and its resolution of the proper standard of review.

CERTIFICATION REGARDING AUTHORSHIP AND FUNDING

No party or counsel in the pending case authored the proposed amicus curiae brief in whole or in part, or made any monetary contribution intended to fund the preparation or submission of the brief. No person or entity other than the proposed *Amicus Curiae* made any monetary contribution intended to fund the preparation or submission of the brief.

Respectfully submitted,

DATED: April 3, 2015

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BRIEF OF AMICUS CURIAE

SUMMARY OF ARGUMENT

The South Coast Air Quality Management District (SCAQMD) submits that this Court should not try to establish a hard-and-fast rule concerning whether lead agencies are required to correlate emissions of air pollutants with specific health consequences in their environmental impact reports (EIR). The level of detail required in EIRs is governed by a few, core CEQA (California Environmental Quality Act) principles. As this Court has stated, "[a]n EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project." (*Laurel Heights Improvement Assn. v. Regents of the Univ of Cal.* (1988) 47 Cal.3d 376, 405 ["*Laurel Heights I*"]) Accordingly, "an agency must use its best efforts to find out and disclose all that it reasonably can." (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 (quoting CEQA Guidelines § 15144)[1].). However, "[a]nalysis of environmental effects need not be exhaustive, but will be judged in light of what is reasonably feasible." (*Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1390; CEQA Guidelines §§ 15151, 15204(a).)

With regard to analysis of air quality related health impacts, EIRs must generally quantify a project's pollutant emissions, but in some cases it is not feasible to correlate these emissions to specific, quantifiable health impacts (e.g., premature mortality; hospital admissions). In such cases, a general description of the adverse health impacts resulting from the pollutants at issue may be sufficient. In other cases, due to the magnitude

[1] The CEQA Guidelines are found at Cal. Code Regs., tit. 14 §§ 15000, *et seq.*

or nature of the pollution emissions, as well as the specificity of the project involved, it may be feasible to quantify health impacts. Or there may be a less exacting, but still meaningful analysis of health impacts that can feasibly be performed. In these instances, agencies should disclose those impacts.

SCAQMD also submits that whether or not an EIR complies with CEQA's informational mandates by providing sufficient, feasible analysis is a mixed question of fact and law. Pertinent here, the question of whether an EIR's discussion of health impacts from air pollution is sufficient to allow the public to understand and consider meaningfully the issues involves two inquiries: (1) Is it feasible to provide the information or analysis that a commenter is requesting or a petitioner is arguing should be required?; and (2) Even if it is feasible, is the agency relying on other policy or legal considerations to justify not preparing the requested analysis? The first question of whether an analysis is feasible is primarily a question of fact that should be judged by the substantial evidence standard. The second inquiry involves evaluating CEQA's information disclosure purposes against the asserted reasons to not perform the requested analysis. For example, an agency might believe that its EIR meets CEQA's informational disclosure standards even without a particular analysis, and therefore choose not to conduct that analysis. SCAQMD submits that this is more of a legal question, which should be reviewed de novo as a question of law.

ARGUMENT

I. RELEVANT FACTUAL AND LEGAL FRAMEWORK.

A. Air Quality Regulatory Background

The South Coast Air Quality Management District (SCAQMD) is one of the local and regional air pollution control districts and air quality

management districts in California. The SCAQMD is the regional air pollution agency for the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410, 17 Cal. Code Reg. § 60104.) The SCAQMD also includes the Coachella Valley in Riverside County (Palm Springs area to the Salton Sea). (SCAQMD, *Final 2012 AQMP (Feb. 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "chapter 7" hyperlink; pp 7-1, 7-3 (last visited Apr. 1, 2015).) The SCAQMD's jurisdiction includes over 16 million residents and has the worst or nearly the worst air pollution levels in the country for ozone and fine particulate matter. (SCAQMD, *Final 2012 AQMP (Feb. 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "Executive Summary" hyperlink p. ES-1 (last visited Apr. 1, 2015).)

Under California law, the local and regional districts are primarily responsible for controlling air pollution from all sources except motor vehicles. (Health & Saf. Code § 40000.) The California Air Resources Board (CARB), part of the California Environmental Protection Agency, is primarily responsible for controlling pollution from motor vehicles. (*Id.*) The air districts must adopt rules to achieve and maintain the state and federal ambient air quality standards within their jurisdictions. (Health & Saf. Code § 40001.)

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to identify pollutants that are widely distributed and pose a threat to human health, developing a so-called "criteria" document. (42 U.S.C. § 7408; CAA § 108.) These pollutants are frequently called "criteria pollutants." EPA must then establish "national ambient air quality standards" at levels "requisite to protect public health",

allowing "an adequate margin of safety." (42 U.S.C. § 7409; CAA § 109.) EPA has set standards for six identified pollutants: ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter (PM), and lead. (U.S. EPA, National Ambient Air Quality Standards (NAAQS), http://www.epa.gov/air/criteria.html (last updated Oct. 21, 2014).)[2]

Under the Clean Air Act, EPA sets emission standards for motor vehicles and "nonroad engines" (mobile farm and construction equipment, marine vessels, locomotives, aircraft, etc.). (42 U.S.C. §§ 7521, 7547; CAA §§ 202, 213.) California is the only state allowed to establish emission standards for motor vehicles and most nonroad sources; however, it may only do so with EPA's approval. (42 U.S.C. §§ 7543(b), 7543(e); CAA §§ 209(b), 209(c).) Sources such as manufacturing facilities, power plants and refineries that are not mobile are often referred to as "stationary sources." The Clean Air Act charges state and local agencies with the primary responsibility to attain the national ambient air quality standards. (42 U.S.C. § 7401(a)(3); CAA § 101(a)(3).) Each state must adopt and implement a plan including enforceable measures to achieve and maintain the national ambient air quality standards. (42 U.S.C. § 7410; CAA § 110.) The SCAQMD and CARB jointly prepare portion of the plan for the South Coast Air Basin and submit it for approval by EPA. (Health & Saf. Code §§ 40460, et seq.)

The Clean Air Act also requires state and local agencies to adopt a permit program requiring, among other things, that new or modified "major" stationary sources use technology to achieve the "lowest achievable emission rate," and to control minor stationary sources as

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[2] Particulate matter (PM) is further divided into two categories: fine particulate or $PM_{2.5}$ (particles with a diameter of less than or equal to 2.5 microns) and coarse particulate (PM_{10}) (particles with a diameter of 10 microns or less). (U.S. EPA, Particulate Matter (PM), http://www.epa.gov/airquality/particlepollution/ (last visited Apr. 1, 2015).)

needed to help attain the standards. (42 U.S.C. §§ 7502(c)(5), 7503(a)(2), 7410(a)(2)(C); CAA §§ 172(c)(5), 173(a)(2), 110(a)(2)(C).) The air districts implement these permit programs in California. (Health & Saf. Code §§ 42300, et seq.)

The Clean Air Act also sets out a regulatory structure for over 100 so-called "hazardous air pollutants" calling for EPA to establish "maximum achievable control technology" (MACT) for sources of these pollutants. (42 U.S.C. § 7412(d)(2); CAA § 112(d)(2).) California refers to these pollutants as "toxic air contaminants" (TACs) which are subject to two state-required programs. The first program requires "air toxics control measures" for specific categories of sources. (Health & Saf. Code § 39666.) The other program requires larger stationary sources and sources identified by air districts to prepare "health risk assessments" for impacts of toxic air contaminants. (Health & Saf. Code §§ 44320(b), 44322, 44360.) If the health risk exceeds levels identified by the district as "significant," the facility must implement a "risk reduction plan" to bring its risk levels below "significant" levels. Air districts may adopt additional more stringent requirements than those required by state law, including requirements for toxic air contaminants. (Health & Saf. Code § 41508; *Western Oil & Gas Assn. v. Monterey Bay Unified APCD* (1989) 49 Cal.3d 408, 414.) For example, SCAQMD has adopted a rule requiring new or modified sources to keep their risks below specified levels and use best available control technology (BACT) for toxics. (SCAQMD, *Rule 1401-New Source Review of Toxic Air Contaminants*, http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiv; then follow "Rule 1401" hyperlink (last visited Apr. 1, 2015).)

B. The SCAQMD's Role Under CEQA

The California Environmental Quality Act (CEQA) requires public agencies to perform an environmental review and appropriate analysis for projects that they implement or approve. (Pub. Resources Code § 21080(a).) The agency with primary approval authority for a particular project is generally the "lead agency" that prepares the appropriate CEQA document. (CEQA Guidelines §§ 15050, 15051.) Other agencies having a subsequent approval authority over all or part of a project are called "responsible" agencies that must determine whether the CEQA document is adequate for their use. (CEQA Guidelines §§ 15096(c), 15381.) Lead agencies must also consult with and circulate their environmental impact reports to "trustee agencies" and agencies "with jurisdiction by law" including "authority over resources which may be affected by the project." (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines §§ 15086(a)(3), 15073(c).) The SCAQMD has a role in all these aspects of CEQA.

Fulfilling its responsibilities to implement its air quality plan and adopt rules to attain the national ambient air quality standards, SCAQMD adopts a dozen or more rules each year to require pollution reductions from a wide variety of sources. The SCAQMD staff evaluates each rule for any adverse environmental impact and prepares the appropriate CEQA document. Although most rules reduce air emissions, they may have secondary environmental impacts such as use of water or energy or disposal of waste—e.g., spent catalyst from control equipment.[3]

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[3] The SCAQMD's CEQA program for its rules is a "Certified Regulatory Program" under which it prepares a "functionally equivalent" document in lieu of a negative declaration or EIR. (Pub. Resources Code § 21080.5, CEQA Guidelines § 15251(l).)

The SCAQMD also approves a large number of permits every year to construct new, modified, or replacement facilities that emit regulated air pollutants. The majority of these air pollutant sources have already been included in an earlier CEQA evaluation for a larger project, are currently being evaluated by a local government as lead agency, or qualify for an exemption. However, the SCAQMD sometimes acts as lead agency for major projects where the local government does not have a discretionary approval. In such cases, SCAQMD prepares and certifies a negative declaration or environmental impact report (EIR) as appropriate.[4] SCAQMD evaluates perhaps a dozen such permit projects under CEQA each year. SCAQMD is often also a "responsible agency" for many projects since it must issue a permit for part of the projects (e.g., a boiler used to provide heat in a commercial building). For permit projects evaluated by another lead agency under CEQA, SCAQMD has the right to determine that the CEQA document is inadequate for its purposes as a responsible agency, but it may not do so because its permit program already requires all permitted sources to use the best available air pollution control technology. (SCAQMD, *Rule 1303(a)(1) – Requirements*, http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiii; then follow "Rule 1303" hyperlink (last visited Apr. 1, 2015).)

Finally, SCAQMD receives as many as 60 or more CEQA documents each month (around 500 per year) in its role as commenting agency or an agency with "jurisdiction by law" over air quality—a natural resource affected by the project. (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines § 15366(a)(3).) The SCAQMD staff provides comments on as many as 25 or 30 such documents each month.

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[4] The SCAQMD's permit projects are not included in its Certified Regulatory Program, and are evaluated under the traditional local government CEQA analysis. (Pub. Resources Code §§ 21150-21154.)

(SCAQMD Governing Board Agenda, Apr. 3, 2015, Agenda Item 16, Attachment A, http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-april-3-2015; then follow "16. Lead Agency Projects and Environmental Documents Received by SCAQMD" hyperlink (last visited Apr. 1, 2015).) Of course, SCAQMD focuses its commenting efforts on the more significant projects.

Typically, SCAQMD comments on the adequacy of air quality analysis, appropriateness of assumptions and methodology, and completeness of the recommended air quality mitigation measures. Staff may comment on the need to prepare a health risk assessment detailing the projected cancer and noncancer risks from toxic air contaminants resulting from the project, particularly the impacts of diesel particulate matter, which CARB has identified as a toxic air contaminant based on its carcinogenic effects. (California Air Resources Board, Resolution 98-35, Aug. 27, 1998, http://www.arb.ca.gov/regact/diesltac/diesltac.htm; then follow Resolution 98-35 hyperlink (last visited Apr. 1, 2015).) Because SCAQMD already requires new or modified stationary sources of toxic air contaminants to use the best available control technology for toxics and to keep their risks below specified levels, (SCAQMD Rule 1401, supra, note 15), the greatest opportunity to further mitigate toxic impacts through the CEQA process is by reducing emissions—particularly diesel emissions—from vehicles.

II. THIS COURT SHOULD NOT SET A HARD-AND-FAST RULE CONCERNING THE EXTENT TO WHICH AN EIR MUST CORRELATE A PROJECT'S EMISSION OF POLLUTANTS WITH RESULTING HEALTH IMPACTS.

Numerous cases hold that courts do not review the correctness of an EIR's conclusions but rather its sufficiency as an informative document. (*Laurel Heights 1, supra*, 47 Cal.3d at p. 392; *Citizens of Goleta Valley v.*

Bd. of Supervisors (1990) 52 Cal.3d 553, 569; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1197.)

As stated by the Court of Appeal in this case, where an EIR has addressed a topic, but the petitioner claims that the information provided about that topic is insufficient, courts must "draw[] a line that divides *sufficient* discussions from those that are *insufficient*." (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) The Court of Appeal readily admitted that "[t]he terms themselves – sufficient and insufficient – provide little, if any, guidance as to where the line should be drawn. They are simply labels applied once the court has completed its analysis." (*Id.*)

The CEQA Guidelines, however, provide guidance regarding what constitutes a sufficient discussion of impacts. Section 15151 states that "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." Case law reflects this: "Analysis of environmental effects need not be exhaustive, but will be judged in light of what was reasonably feasible." (*Association of Irritated Residents v. County of Madera, supra,* 107 Cal.App.4th at p. 1390; see also CEQA Guidelines § 15204(a).)

Applying this test, this Court cannot realistically establish a hard-and-fast rule that an analysis correlating air pollution impacts of a project to quantified resulting health impacts is always required, or indeed that it is never required. Simply put, in some cases such an analysis will be "feasible"; in some cases it will not.

For example, air pollution control districts often require a proposed new source of toxic air contaminants to prepare a "health risk assessment" before issuing a permit to construct. District rules often limit the allowable cancer risk the new source may cause to the "maximally exposed individual" (worker and residence exposures). (*See, e.g.*, SCAQMD Rule 1401(c)(8); 1401(d)(1), *supra* note 15.) In order to perform this analysis, it

is necessary to have data regarding the sources and types of air toxic contaminants, location of emission points, velocity of emissions, the meteorology and topography of the area, and the location of receptors (worker and residence). (SCAQMD, *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588), pp. 11-16*; (last visited Apr. 1, 2015) http://www.aqmd.gov/home/library/documents-support-material; "Guidelines" hyperlink; AB2588; then follow AB2588 Risk Assessment Guidelines hyperlink.)

Thus, it is feasible to determine the health risk posed by a new gas station locating at an intersection in a mixed use area, where receptor locations are known. On the other hand, it may not be feasible to perform a health risk assessment for airborne toxics that will be emitted by a generic industrial building that was built on "speculation" (i.e., without knowing the future tenant(s)). Even where a health risk assessment can be prepared, however, the resulting maximum health risk value is only a calculation of risk—it does not necessarily mean anyone will contract cancer as a result of the project.

In order to find the "cancer burden" or expected additional cases of cancer resulting from the project, it is also necessary to know the numbers and location of individuals living within the "zone of impact" of the project: i.e., those living in areas where the projected cancer risk from the project exceeds one in a million. (SCAQMD, Health Risk Assessment Summary form, http://www.aqmd.gov/home/forms ; filter by "AB2588" category; then "Health Risk Assessment" hyperlink (last visited Apr. 1, 2015).) The affected population is divided into bands of those exposed to at least 1 in a million risk, those exposed to at least 10 in a million risk, etc. up to those exposed at the highest levels. (*Id.*) This data allows agencies to calculate an approximate number of additional cancer cases expected from

the project. However, it is not possible to predict which particular individuals will be affected.

For the so-called criteria pollutants[5], such as ozone, it may be more difficult to quantify health impacts. Ozone is formed in the atmosphere from the chemical reaction of the nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. (U.S. EPA, Ground Level Ozone, http://www.epa.gov/airquality/ozonepollution/ (last updated Mar. 25, 2015).) It takes time and the influence of meteorological conditions for these reactions to occur, so ozone may be formed at a distance downwind from the sources. (U.S. EPA, *Guideline on Ozone Monitoring Site Selection* (Aug. 1998) EPA-454/R-98-002 § 5.1.2, http://www.epa.gov/ttnamti1/archive/cpreldoc.html (last visited Apr. 1, 2015).) NO_x and VOC are known as "precursors" of ozone.

Scientifically, health effects from ozone are correlated with increases in the ambient level of ozone in the air a person breathes. (U.S. EPA, *Health Effects of Ozone in the General Population,* Figure 9, http://www.epa.gov/apti/ozonehealth/population.html#levels (last visited Apr. 1, 2015).) However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels over an entire region. For example, the SCAQMD's 2012 AQMP showed that reducing NO_x by 432 tons per day (157,680 tons/year) and reducing VOC by 187 tons per day (68,255 tons/year) would reduce ozone levels at the SCAQMD's monitor site with the highest levels by only 9 parts per billion. (South Coast Air Quality Management District, *Final 2012 AQMP (February 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "Appendix V: Modeling & Attainment Demonstrations" hyperlink,

[5] See discussion of types of pollutants, supra, Part I.A.

pp. v-4-2, v-7-4, v-7-24.) SCAQMD staff does not currently know of a way to accurately quantify ozone-related health impacts caused by NO_x or VOC emissions from relatively small projects.

On the other hand, this type of analysis may be feasible for projects on a regional scale with very high emissions of NO_x and VOCs, where impacts are regional. For example, in 2011 the SCAQMD performed a health impact analysis in its CEQA document for proposed Rule 1315, which authorized various newly-permitted sources to use offsets from the districts "internal bank" of emission reductions. This CEQA analysis accounted for essentially *all* the increases in emissions due to new or modified sources in the District between 2010 and 2030.[6] The SCAQMD was able to correlate this very large emissions increase (e.g., 6,620 pounds per day NO_x (1,208 tons per year), 89,180 pounds per day VOC (16,275 tons per year)) to expected health outcomes from ozone and particulate matter (e.g., 20 premature deaths per year and 89,947 school absences in the year 2030 due to ozone).[7] (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System* (see hyperlink in fn 6*)* at p. 4.1-35, Table 4.1-29.)

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[6] (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, Attachment G, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System, Vol. 1, p.4.0-6,* http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-february-4-2011; the follow "26. Adopt Proposed Rule 1315 – Federal New Source Review Tracking System" (last visited April 1, 2015).)

[7] The SCAQMD was able to establish the location of future NO_x and VOC emissions by assuming that new projects would be built in the same locations and proportions as existing stationary sources. This CEQA document was upheld by the Los Angeles County Superior Court in *Natural Res. Def. Council v SCAQMD*, Los Angeles Superior Court No. BS110792).

However, a project emitting only 10 tons per year of NO_x or VOC is small enough that its regional impact on ambient ozone levels may not be detected in the regional air quality models that are currently used to determine ozone levels. Thus, in this case it would not be feasible to directly correlate project emissions of VOC or NO_x with specific health impacts from ozone. This is in part because ozone formation is not linearly related to emissions. Ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology and seasonal impacts, and because ozone is formed some time later and downwind from the actual emission. (EPA Guideline on Ozone Monitoring Site Selection (Aug. 1998) EPA-454/R-98-002, § 5.1.2; https://www.epa.gov/ttnamti1/archive/cpreldoc.html; then search "Guideline on Ozone Monitoring Site Selection" click on pdf) (last viewed Apr. 1, 2015).)

SCAQMD has set its CEQA "significance" threshold for NO_x and VOC at 10 tons per year (expressed as 55 lb/day). (SCAQMD, *Air Quality Analysis Handbook*, http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook; then follow "SCAQMD Air Quality Significance Thresholds" hyperlink (last visited Apr. 1, 2015).) This is because the federal Clean Air Act defines a "major" stationary source for "extreme" ozone nonattainment areas such as SCAQMD as one emitting 10 tons/year. (42 U.S.C. §§ 7511a(e), 7511a(f); CAA §§ 182(e), 182(f).) Under the Clean Air Act, such sources are subject to enhanced control requirements (42 U.S.C. §§ 7502(c)(5), 7503; CAA §§ 172(c)(5), 173), so SCAQMD decided this was an appropriate threshold for making a CEQA "significance" finding and requiring feasible mitigation. Essentially, SCAQMD takes the position that a source that emits 10 tons/year of NO_x or VOC would contribute cumulatively to ozone formation. Therefore, lead agencies that use SCAQMD's thresholds of significance may determine

that many projects have "significant" air quality impacts and must apply all feasible mitigation measures, yet will not be able to precisely correlate the project to quantifiable health impacts, unless the emissions are sufficiently high to use a regional modeling program.

In the case of particulate matter ($PM_{2.5}$)[8], another "criteria" pollutant, SCAQMD staff is aware of two possible methods of analysis. SCAQMD used regional modeling to predict expected health impacts from its proposed Rule 1315, as mentioned above. Also, the California Air Resources Board (CARB) has developed a methodology that can predict expected mortality (premature deaths) from large amounts of $PM_{2.5}$. (California Air Resources Board, *Health Impacts Analysis: PM Premature Death Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort_arch.htm (last reviewed Jan. 19, 2012).) SCAQMD used the CARB methodology to predict impacts from three very large power plants (e.g., 731-1837 lbs/day). (Final Environmental Assessment for Rule 1315, *supra*, pp 4.0-12, 4.1-13, 4.1-37 (e.g., 125 premature deaths in the entire SCAQMD in 2030), 4.1-39 (0.05 to 1.77 annual premature deaths from power plants.) Again, this project involved large amounts of additional $PM_{2.5}$ in the District, up to 2.82 tons/day (5,650 lbs/day of $PM_{2.5}$, or, or 1029 tons/year. (*Id.* at table 4.1-4, p. 4.1-10.)

However, the primary author of the CARB methodology has reported that this $PM_{2.5}$ health impact methodology is not suited for small projects and may yield unreliable results due to various uncertainties. [9] (SCAQMD, *Final Subsequent Mitigated Negative Declaration for: Warren*

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[8] SCAQMD has not attained the latest annual or 24-hour national ambient air quality standards for "$PM_{2.5}$" or particulate matter less than 2.5 microns in diameter.

[9] Among these uncertainties are the representativeness of the population used in the methodology, and the specific source of PM and the corresponding health impacts. (*Id.* at p. 2-24.)

E&P, Inc. WTU Central Facility, New Equipment Project (certified July 19, 2011), http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2011; then follow "Final Subsequent Mitigated Negative Declaration for Warren E&P Inc. WTU Central Facility, New Equipment Project" hyperlink, pp. 2-22, 2-23 (last visited Apr. 1, 2015).) Therefore, when SCAQMD prepared a CEQA document for the expansion of an existing oil production facility, with very small $PM_{2.5}$ increases (3.8 lb/day) and a very small affected population, staff elected not to use the CARB methodology for using estimated $PM_{2.5}$ emissions to derive a projected premature mortality number and explained why it would be inappropriate to do so. (*Id.* at pp 2-22 to 2-24.) SCAQMD staff concluded that use of this methodology for such a small source could result in unreliable findings and would not provide meaningful information. (*Id.* at pp. 2-23, 2-25.) This CEQA document was not challenged in court.

In the above case, while it may have been technically possible to plug the data into the methodology, the results would not have been reliable or meaningful. SCAQMD believes that an agency should not be required to perform analyses that do not produce reliable or meaningful results. This Court has already held that an agency may decline to use even the "normal" "existing conditions" CEQA baseline where to do so would be misleading or without informational value. (*Neighbors for Smart Rail v. Exposition Metro Line* (2013) 57 Cal.4th 439, 448, 457.) The same should be true for a decision that a particular study or analysis would not provide reliable or meaningful results.[10]

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[10] Whether a particular study would result in "informational value" is a part of deciding whether it is "feasible." CEQA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and

Therefore, it is not possible to set a hard-and-fast rule on whether a correlation of air quality impacts with specific quantifiable health impacts is required in all cases. Instead, the result turns on whether such an analysis is reasonably feasible in the particular case.[11] Moreover, what is reasonably feasible may change over time as scientists and regulatory agencies continually seek to improve their ability to predict health impacts. For example, CARB staff has been directed by its Governing Board to reassess and improve the methodology for estimating premature deaths. (California Air Resources Board, *Health Impacts Analysis: PM Mortality Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm (last reviewed Dec. 29, 2010).) This factor also counsels against setting any hard-and-fast rule in this case.

III. THE QUESTION OF WHETHER AN EIR CONTAINS SUFFICIENT ANALYSIS TO MEET CEQA'S REQUIREMENTS IS A MIXED QUESTION OF FACT AND LAW GOVERNED BY TWO DIFFERENT STANDARDS OF REVIEW.

A. Standard of Review for Feasibility Determination and Sufficiency as an Informative Document

A second issue in this case is whether courts should review an EIR's informational sufficiency under the "substantial evidence" test as argued by Friant Ranch or the "independent judgment" test as argued by Sierra Club.

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technological factors." (Pub. Resources Code § 21061.1.) A study cannot be "accomplished in a *successful* manner" if it produces unreliable or misleading results.

[11] In this case, the lead agency did not have an opportunity to determine whether the requested analysis was feasible because the comment was non-specific. Therefore, SCAQMD suggests that this Court, after resolving the legal issues in the case, direct the Court of Appeal to remand the case to the lead agency for a determination of whether the requested analysis is feasible. Because Fresno County, the lead agency, did not seek review in this Court, it seems likely that the County has concluded that at least some level of correlation of air pollution with health impacts is feasible.

As this Court has explained, "a reviewing court must adjust its scrutiny to the nature of the alleged defect, depending on whether the claim is predominantly one of improper procedure or a dispute over the facts." (*Vineyard Area Citizens v. City of Rancho Cordova, supra,* 40 Cal.4th at 435.) For questions regarding compliance with proper procedure or other legal questions, courts review an agency's action de novo under the "independent judgment" test. (*Id.*) On the other hand, courts review factual disputes only for substantial evidence, thereby "accord[ing] greater deference to the agency's substantive factual conclusions." (*Id.*)

Here, Friant Ranch and Sierra Club agree that the case involves the question of whether an EIR includes sufficient information regarding a project's impacts. However, they disagree on the proper standard of review for answering this question: Sierra Club contends that courts use the independent judgment standard to determine whether an EIR's analysis is sufficient to meet CEQA's informational purposes,[12] while Friant Ranch contends that the substantial evidence standard applies to this question.

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[12] Sierra Club acknowledges that courts use the substantial evidence standard when reviewing predicate factual issues, but argues that courts ultimately decide as a matter of law what CEQA requires. (Answering Brief, pp. 14, 23.)

SCAQMD submits that the issue is more nuanced than either party contends. We submit that, whether a CEQA document includes sufficient analysis to satisfy CEQA's informational mandates is a mixed question of fact and law,[13] containing two levels of inquiry that should be judged by different standards.[14]

The state CEQA Guidelines set forth standards for the adequacy of environmental analysis. Guidelines Section 15151 states:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection, but for adequacy, completeness, and a good-faith effort at full disclosure.

In this case, the basic question is whether the underlying analysis of air quality impacts made the EIR "sufficient" as an informative document. However, whether the EIR's analysis was sufficient is judged in light of what was reasonably feasible. This represents a mixed question of fact and law that is governed by two different standards of review.

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[13] Friant Ranch actually states that the claim that an EIR lacks sufficient relevant information is, "most properly thought of as raising mixed questions of fact and law." (Opening Brief, p. 27.) However, the remainder of its argument claims that the court should apply the substantial evidence standard of review to all aspects of the issue.

[14] Mixed questions of fact and law issues may implicate predominantly factual subordinate questions that are reviewed under the substantial evidence test even though the ultimate question may be reviewed by the independent judgment test. *Crocker National Bank v. City and County of San Francisco* (1989) 49 Cal.3d 881, 888-889.

SCAQMD submits that an EIR's sufficiency as an informational document is ultimately a legal question that courts should determine using their independent judgment. This Court's language in *Laurel Heights I* supports this position. As this Court explained: "The court does not pass upon the correctness of the EIR's environmental conclusions, but only upon its *sufficiency as an informative document.*" (*Laurel Heights I, supra,* 47 Cal.3d at 392-393) (emphasis added.) As described above, the Court in *Vineyard Area Citizens v. City of Rancho Cordova, supra,* 40 Cal.4th at 431, also used its independent judgment to determine what level of analysis CEQA requires for water supply impacts. The Court did not defer to the lead agency's opinion regarding the law's requirements; rather, it determined for itself what level of analysis was necessary to meet "[t]he law's informational demands." (*Id.* at p. 432.) Further, existing case law also holds that where an agency fails to comply with CEQA's information disclosure requirements, the agency has "failed to proceed in the manner required by law." (*Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 118.)

However, whether an EIR satisfies CEQA's requirements depends in part on whether it was reasonably feasible for an agency to conduct additional or more thorough analysis. EIRs must contain "a detailed statement" of a project's impacts (Pub. Res. Code § 21061), and an agency must "use its best efforts to find out and disclose all that it reasonably can." (CEQA Guidelines § 15144.) Nevertheless, "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." (CEQA Guidelines § 15151.)

SCAQMD submits that the question of whether additional analysis or a particular study suggested by a commenter is "feasible" is generally a question of fact. Courts have already held that whether a particular alternative is "feasible" is reviewed by the substantial evidence test.

(*Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 598-99; *Center for Biological Diversity v. County of San Bernardino* (2010) 185 Cal.App.4th 866, 883.) Thus, if a lead agency determines that a particular study or analysis is infeasible, that decision should generally be judged by the substantial evidence standard. However, SCAQMD urges this Court to hold that lead agencies must explain the basis of any determination that a particular analysis is infeasible in the EIR itself. An EIR must discuss information, including issues related to the feasibility of particular analyses "in sufficient detail to enable meaningful participation and criticism by the public. '[W]hatever is required to be considered in an EIR must be in that formal report; what any official might have known from other writings or oral presentations cannot supply what is lacking in the report.'" (*Laurel Heights I, supra*, 47 Cal.3d at p. 405 (quoting *Santiago County Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 831) (discussing analysis of alternatives).) The evidence on which the determination is based should also be summarized in the EIR itself, with appropriate citations to reference materials if necessary. Otherwise commenting agencies such as SCAQMD would be forced to guess where the lead agency's evidence might be located, thus thwarting effective public participation.

Moreover, if a lead agency determines that a particular study or analysis would not result in reliable or useful information and for that reason is not feasible, that determination should be judged by the substantial evidence test. (See *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*, *supra*, 57 Cal.4th 439, 448, 457:

whether "existing conditions" baseline would be misleading or uninformative judged by substantial evidence standard.[15])

If the lead agency's determination that a particular analysis or study is not feasible is supported by substantial evidence, then the agency has not violated CEQA's information disclosure provisions, since it would be infeasible to provide additional information. This Court's decisions provide precedent for such a result. For example, this Court determined that the issue of whether the EIR should have included a more detailed discussion of future herbicide use was resolved because substantial evidence supported the agency's finding that "the precise parameters of future herbicide use could not be predicted." *Ebbetts Pass Forest Watch v. California Dept. of Forestry & Fire Protection* (2008) 43 Cal.4th 936, 955.

Of course, SCAQMD expects that courts will continue to hold lead agencies to their obligations to consult with, and not to ignore or misrepresent, the views of sister agencies having special expertise in the area of air quality. (*Berkeley Keep Jets Over the Bay v. Board of Port Commissioners* (2007) 91 Cal.App.4th 1344, 1364 n.11.) In some cases, information provided by such expert agencies may establish that the purported evidence relied on by the lead agency is not in fact "substantial". (*Id.* at pp. 1369-1371.)

In sum, courts retain ultimate responsibility to determine what CEQA requires. However, the law does not require exhaustive analysis, but only what is reasonably feasible. Agencies deserve deference for their factual determinations regarding what type of analysis is reasonably feasible. On the other hand, if a commenter requests more information, and the lead agency declines to provide it but does *not* determine that the

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[15] The substantial evidence standard recognizes that the courts "have neither the resources nor the scientific expertise" to weigh conflicting evidence on technical issues. (*Laurel Heights I, supra,* 47 Cal.3d 376, 393.)

requested study or analysis would be infeasible, misleading or uninformative, the question becomes whether the omission of that analysis renders the EIR inadequate to satisfy CEQA's informational purposes. (*Id.* at pp. 1370-71.) Again, this is predominantly a question of law and should be judged by the de novo or independent judgment standard of review. Of course, this Court has recognized that a "project opponent or reviewing court can always imagine some additional study or analysis that might provide helpful information. It is not for them to design the EIR. That further study...might be helpful does not make it necessary." (*Laurel Heights I, supra,* 47 Cal.3d 376, 415 – see also CEQA Guidelines § 15204(a) [CEQA "does not require a lead agency to conduct every test. . . recommended or demanded by commenters."].) Courts, then, must adjudicate whether an omission of particular information renders an EIR inadequate to serve CEQA's informational purposes.[16]

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[16] We recognize that there is case law stating that the substantial evidence standard applies to "challenges to the scope of an EIR's analysis of a topic" as well as the methodology used and the accuracy of the data relied on in the document "because these types of challenges involve factual questions." (*Bakersfield Citizens for Local Control v. City of Bakersfield, supra,* 124 Cal.App.4th 1184, 1198, and cases relied on therein.) However, we interpret this language to refer to situations where the question of the scope of the analysis really is factual—that is, where it involves whether further analysis is feasible, as discussed above. This interpretation is supported by the fact that the *Bakersfield* court expressly rejected an argument that a claimed "omission of information from the EIR should be treated as inquiries whether there is substantial evidence supporting the decision approving the project. " *Bakersfield, supra,* 124 Cal.App.4th at p. 1208. And the *Bakersfield* court ultimately decided that the lead agency must analyze the connection between the identified air pollution impacts and resulting health impacts, even though the EIR already included some discussion of air-pollution-related respiratory illnesses. *Bakersfield, supra,* 124 Cal.App.4th at p. 1220. Therefore, the court must not have interpreted this question as one of the "scope of the analysis" to be judged by the substantial evidence standard.

B. Friant Ranch's Rationale for Rejecting the Independent Judgment Standard of Review is Unsupported by Case Law.

In its brief, Friant Ranch makes a distinction between cases where a required CEQA topic is not discussed at all (to be reviewed by independent judgment as a failure to proceed in the manner required by law) and cases where a topic is discussed, but the commenter claims the information provided is insufficient (to be judged by the substantial evidence test). (Opening Brief, pp. 13-17.) The Court of Appeal recognized these two types of cases, but concluded that both raised questions of law. (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) We believe the distinction drawn by Friant Ranch is unduly narrow, and inconsistent with cases which have concluded that CEQA documents are insufficient. In many instances, CEQA's requirements are stated broadly, and the courts must interpret the law to determine what level of analysis satisfies CEQA's mandate for providing meaningful information, even though the EIR discusses the issue to some extent.

For example, the CEQA Guidelines require discussion of the existing environmental baseline. In *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 954-955, the lead agency had discussed the environmental baseline by describing historic month-end water levels in the affected lakes. However, the court held that this was not an adequate baseline discussion because it failed to discuss the timing and amounts of past actual water releases, to allow comparison with the proposed project. The court evidently applied the independent judgment test to its decision, even though the agency discussed the issue to some extent.

Likewise, in *Vineyard Area Citizens* (2007) 40 Cal.4th 412, this Court addressed the question of whether an EIR's analysis of water supply impacts complied with CEQA. The parties agreed that the EIR was required to analyze the effects of providing water to the development project, "and that in order to do so the EIR had, in some manner, to identify the planned sources of that water." (*Vineyard Area Citizens, supra,* at p. 428.) However, the parties disagreed as to the level of detail required for this analysis and "what level of uncertainty regarding the availability of water supplies can be tolerated in an EIR . . . ." (*Id.*) In other words, the EIR had analyzed water supply impacts for the project, but the petitioner claimed that the analysis was insufficient.

This Court noted that neither CEQA's statutory language or the CEQA Guidelines specifically addressed the question of how precisely an EIR must discuss water supply impacts. (*Id.*) However, it explained that CEQA "states that '[w]hile foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can.'" (*Id.*, [Guidelines § 15144].) The Court used this general principle, along with prior precedent, to elucidate four "principles for analytical adequacy" that are necessary in order to satisfy "CEQA's informational purposes." (*Vineyard Area Citizens, supra,* at p. 430.) The Court did not defer to the agency's determination that the EIR's analysis of water supply impacts was sufficient. Rather, this Court used its independent judgment to determine for itself the level of analysis required to satisfy CEQA's fundamental purposes. (*Vineyard Area Citizens, supra*, at p. 441: an EIR does not serve its purposes where it neglects to explain likely sources of water and "... leaves long term water supply considerations to later stages of the project.")

Similarly, the CEQA Guidelines require an analysis of noise impacts of the project. (Appendix G, "Environmental Checklist Form."[17]) In *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, 1123, the court held that the lead agency's noise impact analysis was inadequate even though it had addressed the issue and concluded that the increase would not be noticeable. If the court had been using the substantial evidence standard, it likely would have upheld this discussion.

Therefore, we do not agree that the issue can be resolved on the basis suggested by Friant Ranch, which would apply the substantial evidence standard to *every* challenge to an analysis that addresses a required CEQA topic. This interpretation would subvert the courts' proper role in interpreting CEQA and determining what the law requires.

Nor do we agree that the Court of Appeal in this case violated CEQA's prohibition on courts interpreting its provisions "in a manner which imposes procedural or substantive requirements beyond those explicitly stated in this division or in the state guidelines." (Pub. Resources Code § 21083.1.) CEQA requires an EIR to describe *all* significant impacts of the project on the environment. (Pub. Resources Code § 21100(b)(2); *Vineyard Area Citizens, supra,* at p. 428.) Human beings are part of the environment, so CEQA requires EIRs to discuss a project's significant impacts on human health. However, except in certain particular circumstances,[18] neither the CEQA statute nor Guidelines specify the precise level of analysis that agencies must undertake to satisfy the law's requirements. (see, e.g., CEQA Guidelines § 15126.2(a) [EIRs must describe "health and safety problems caused by {a project's} physical changes"].) Accordingly, courts must interpret CEQA as a whole to

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[17] Association of Environmental Professionals, 2015 CEQA Statute and Guidelines (2015) p.287.

[18] E.g., Pub. Resources Code § 21151.8(C)(3)(B)(iii) (requiring specific type of health risk analysis for siting schools).

determine whether a particular EIR is sufficient as an informational document. A court determining whether an EIR's discussion of human health impacts is legally sufficient does not constitute imposing a new substantive requirement.[19] Under Friant Ranch's theory, the above-referenced cases holding a CEQA analysis inadequate would have violated the law. This is not a reasonable interpretation.

IV. COURTS MUST SCRUPULOUSLY ENFORCE THE REQUIREMENTS THAT LEAD AGENCIES CONSULT WITH AND OBTAIN COMMENTS FROM AIR DISTRICTS

Courts must "scrupulously enforce" CEQA's legislatively mandated requirements. (*Vineyard Area Citizens, supra*, 40 Cal.4th 412, 435.) Case law has firmly established that lead agencies must consult with the relevant air pollution control district before conducting an initial study, and must provide the districts with notice of the intention to adopt a negative declaration (or EIR). (*Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 958.) As *Schenck* held, neither publishing the notice nor providing it to the State Clearinghouse was a sufficient substitute for sending notice directly to the air district. (*Id.*) Rather, courts "must be satisfied that [administrative] agencies have fully complied with the procedural requirements of CEQA, since only in this way can the important public purposes of CEQA be protected from subversion." *Schenck,* 198 Cal.App.4th at p. 959 (citations omitted).[20]

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[19] We submit that Public Resources Code Section 21083.1 was intended to prevent courts from, for example, holding that an agency must analyze economic impacts of a project where there are no resulting environmental impacts (see CEQA Guidelines § 15131) , or imposing new procedural requirements, such as imposing additional public notice requirements not set forth in CEQA or the Guidelines.

[20] Lead agencies must consult air districts, as public agencies with jurisdiction by law over resources affected by the project, *before* releasing an EIR. (Pub. Resources Code §§ 21104(a); 21153.) Moreover, air

Lead agencies should be aware, therefore, that failure to properly seek and consider input from the relevant air district constitutes legal error which may jeopardize their project approvals. For example, the court in *Fall River Wild Trout Foundation v. County of Shasta,* (1999) 70 Cal.App.4th 482, 492 held that the failure to give notice to a trustee agency (Department of Fish and Game) was prejudicial error requiring reversal. The court explained that the lack of notice prevented the Department from providing any response to the CEQA document. (*Id.* at p. 492.) It therefore prevented relevant information from being presented to the lead agency, which was prejudicial error because it precluded informed decision-making. (*Id.*)[21]

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districts should be considered "state agencies" for purposes of the requirement to consult with "trustee agencies" as set forth in Public Resources Code § 20180.3(a). This Court has long ago held that the districts are not mere "local agencies" whose regulations are superseded by those of a state agency regarding matters of statewide concern, but rather have concurrent jurisdiction over such issues. (*Orange County Air Pollution Control District v. Public Util. Com.* (1971) 4 Cal.3d 945, 951, 954.) Since air pollution is a matter of statewide concern, *Id* at 952, air districts should be entitled to trustee agency status in order to ensure that this vital concern is adequately protected during the CEQA process.

[21] In *Schenck,* the court concluded that failure to give notice to the air district was not prejudicial, but this was partly because the trial court had already corrected the error before the case arrived at the Court of Appeal. The trial court issued a writ of mandate requiring the lead agency to give notice to the air district. The air district responded by concurring with the lead agency that air impacts were not significant. (*Schenck,* 198 Cal.App.4th 949, 960.) We disagree with the *Schenck* court that the failure to give notice to the air district would not have been prejudicial (even in the absence of the trial court writ) merely because the lead agency purported to follow the air district's published CEQA guidelines for significance. (*Id.*, 198 Cal.App.4th at p. 960.) In the first place, absent notice to the air district, it is uncertain whether the lead agency properly followed those guidelines. Moreover, it is not realistic to expect that an air district's published guidelines would necessarily fully address all possible air-quality related issues that can arise with a CEQA project, or that those

Similarly, lead agencies must obtain additional information requested by expert agencies, including those with jurisdiction by law, if that information is necessary to determine a project's impacts. (*Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236-37.) Approving a project without obtaining that information constitutes a failure to proceed in the manner prescribed by CEQA. (*Id.* at p. 1236.)

Moreover, a lead agency can save significant time and money by consulting with the air district early in the process. For example, the lead agency can learn what the air district recommends as an appropriate analysis on the facts of its case, including what kinds of health impacts analysis may be available, and what models are appropriate for use. This saves the lead agency from the need to do its analysis all over again and possibly needing to recirculate the document after errors are corrected, if new significant impacts are identified. (CEQA Guidelines § 15088.5(a).) At the same time, the air district's expert input can help the lead agency properly determine whether another commenter's request for additional analysis or studies is reasonable or feasible. Finally, the air district can provide input on what mitigation measures would be feasible and effective.

Therefore, we suggest that this Court provide guidance to lead agencies reminding them of the importance of consulting with the relevant air districts regarding these issues. Otherwise, their feasibility decisions may be vulnerable to air district evidence that establishes that there is no substantial evidence to support the lead agency decision not to provide specific analysis. (*See Berkeley Keep Jets Over the Bay, supra,* 91 Cal.App.4th 1344, 1369-1371.)

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guidelines would necessarily be continually modified to reflect new developments. Therefore we believe that, had the trial court not already ordered the lead agency to obtain the air district's views, the failure to give notice would have been prejudicial, as in *Fall River, supra,* 70 Cal.App.4th 482, 492.

CONCLUSION

The SCAQMD respectfully requests this Court *not* to establish a hard-and-fast rule concerning whether CEQA requires a lead agency to correlate identified air quality impacts of a project with resulting health outcomes. Moreover, the question of whether an EIR is "sufficient as an informational document" is a mixed question of fact and law containing two levels of inquiry. Whether a particular proposed analysis is feasible is predominantly a question of fact to be judged by the substantial evidence standard of review. Where the requested analysis is feasible, but the lead agency relies on legal or policy reasons not to provide it, the question of whether the EIR is nevertheless sufficient as an informational document is predominantly a question of law to be judged by the independent judgment standard of review.

Respectfully submitted,

DATED: April 3, 2015

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
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CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.520(c)(1) of the California Rules of Court, I hereby certify that this brief contains 8,476 words, including footnotes, but excluding the Application, Table of Contents, Table of Authorities, Certificate of Service, this Certificate of Word Count, and signature blocks. I have relied on the word count of the Microsoft Word Vista program used to prepare this Certificate.

DATED: April 3, 2015 Respectfully submitted,

Barbara Baird

Barbara Baird

PROOF OF SERVICE

I am employed in the County of Los Angeles, California. I am over the age of 18 years and not a party to the within action. My business address is 21865 Copley Drive, Diamond Bar, California 91765.

On April 3, 2015 I served true copies of the following document(s) described as **APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND *[PROPOSED]* BRIEF OF *AMICUS CURIAE*** by placing a true copy of the foregoing document(s) in a sealed envelope addressed as set forth on the attached service list as follows:

BY MAIL: I enclosed the document(s) in a sealed envelope or package addressed to the persons at the addresses listed in the Service List and placed the envelope for collection and mailing following our ordinary business practices. I am readily familiar with this District's practice for collection and processing of correspondence for mailing. Under that practice, the correspondence would be deposited with the United States Postal Service, with postage thereon fully prepaid at Diamond Bar, California, in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on April 3, 2015 at Diamond Bar, California.

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SUPREME COURT COPY

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

SUPREME COURT
FILED
APR 13 2015
Frank A. McGuire Clerk
Deputy

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

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APPLICATION

Pursuant to California Rules of Court 8.520(f)(1), proposed Amicus Curiae San Joaquin Valley Unified Air Pollution Control District hereby requests permission from the Chief Justice to file an amicus brief in support of Defendant and Respondent, County of Fresno, and Defendant and Real Parties in Interest Friant Ranch, L.P. Pursuant to Rule 8.520(f)(5) of the California Rules of Court, the proposed amicus curiae brief is combined with this Application. The brief addresses the following issue certified by this Court for review:

> Is an EIR adequate when it identifies the health impacts of air pollution and quantifies a project's expected emissions, or does CEQA further require the EIR to *correlate* a project's air quality emissions to specific health impacts?

As of the date of this filing, the deadline for the final reply brief on the merits was March 5, 2015. Accordingly, under Rule 8.520(f)(2), this application and brief are timely.

1. Background and Interest of San Joaquin Valley Unified Air Pollution Control District

The San Joaquin Valley Unified Air Pollution Control District ("Air District") regulates air quality in the eight counties comprising the San Joaquin Valley ("Central Valley"): Kern, Tulare, Madera, Fresno, Merced, San Joaquin, Stanislaus, and Kings, and is primarily responsible for attaining air quality standards within its jurisdiction. After billions of dollars of investment by Central Valley businesses, pioneering air quality regulations, and consistent cfforts by residents, the Central Valley air basin has made historic improvements in air quality.

The Central Valley's geographical, topographical and meteorological features create exceptionally challenging air quality

conditions. For example, it receives air pollution transported from the San Francisco Bay Area and northern Central Valley communities, and the southern portion of the Central Valley includes three mountain ranges (Sierra, Tehachapi, and Coastal) that, under some meteorological conditions, effectively trap air pollution. Central Valley air pollution is only a fraction of what the Bay Area and Los Angeles produce, but these natural conditions result in air quality conditions that are only marginally better than Los Angeles, even though about ten times more pollution is emitted in the Los Angeles region. Bay Area air quality is much better than the Central Valley's, even though the Bay Area produces about six times more pollution. The Central Valley also receives air pollution transported from the Bay Area and northern counties in the Central Valley, including Sacramento, and transboundary anthropogenic ozone from as far away as China.

Notwithstanding these challenges, the Central Valley has reduced emissions at the same or better rate than other areas in California and has achieved unparalleled milestones in protecting public health and the environment:

- In the last decade, the Central Valley became the first air basin classified by the federal government under the Clean Air Act as a "serious nonattainment" area to come into attainment of health-based National Ambient Air Quality Standard ("NAAQS") for coarse particulate matter (PM10), an achievement made even more notable given the Valley's extensive agricultural sector. Unhealthy levels of particulate matter can cause and exacerbate a range of chronic and acute illnesses.
- In 2013, the Central Valley became the first air basin in the country to improve from a federal designation of "extreme" nonattainment to

actually attain (and quality for an attainment designation) of the 1-hour ozone NAAQS; ozone creates "smog" and, like PM10, causes adverse health impacts.

- The Central Valley also is in full attainment of federal standards for lead, nitrogen dioxide, sulfur dioxide, and carbon monoxide.
- The Central Valley continues to make progress toward compliance with its last two attainment standards, with the number of exceedences for the 8-hour ozone NAAQS reduced by 74% (for the 1997 standard) and 38% (for the 2008 standard) since 1991, and for the small particulate matter (PM2.5) NAAQS reduced by 85% (for the 1997 standard) and 61% (for the 2006 standard).

Sustained improvement in Central Valley air quality requires a rigorous and comprehensive regulatory framework that includes prohibitions (e.g., on wood-burning fireplaces in new residences), mandates (e.g., requiring the installation of best available pollution reduction technologies on new and modified equipment and industrial operations), innovations (e.g., fees assessed against residential development to fund pollution reduction actions to "offset" vehicular emissions associated with new residences), incentive programs (e.g., funding replacements of older, more polluting heavy duty trucks and school buses)[1], ongoing planning for continued air quality improvements, and enforcement of Air District permits and regulations.

The Air District is also an expert air quality agency for the eight counties and cities in the San Joaquin Valley. In that capacity, the Air District has developed air quality emission guidelines for use by the Central

[1] San Joaquin's incentive program has been so successful that through 2012, it has awarded over $ 432 million in incentive funds and has achieved 93,349 tons of lifetime emissions reductions. *See* SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 2012 PM2.5 PLAN, 6-6 (2012) *available at* http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/06%20Chapter%206%20Incentives.pdf.

Valley counties and cities that implement the California Environment Quality Act (CEQA).[2] In its guidance, the Air District has distinguished between toxic air contaminants and criteria air pollutants.[3] Recognizing this distinction, the Air District's CEQA Guidance has adopted distinct thresholds of significance for *criteria* pollutants (i.e., ozone, PM2.5 and their respective precursor pollutants) based upon scientific and factual data which demonstrates the level that can be accommodated on a cumulative basis in the San Joaquin Valley without affecting the attainment of the applicable NAAQS.[4] For *toxic air* pollutants, the District has adopted different thresholds of significance which scientific and factual data demonstrates has the potential to expose sensitive receptors (i.e., children, the elderly) to levels which may result in localized health impacts.[5]

The Air District's CEQA Guidance was followed by the County of Fresno in its environment review of the Friant Ranch project, for which the Air District also served as a commenting agency. The Court of Appeal's holding, however, requiring correlation between the project's criteria

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[2] *See, e.g.*, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, PLANNING DIVISION, GUIDE FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2015), *available at* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf ("CEQA Guidance").

[3] Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from toxic air contaminants and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of toxic air contaminants occurs solely under section 112 of the Act. Compare 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 with 42 U.S.C. § 7411.

[4] See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 64-66, 80.

[5] See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 66, 99-101.

pollutants and local health impacts, departs from the Air District's Guidance and approved methodology for assessing criteria pollutants. A close reading of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants (for which a local health risk assessment is feasible and routinely performed) and criteria air pollutants (for which a local health risk assessment is not feasible and would result in speculative results).[6] The Air District has a direct interest in ensuring the lawfulness and consistent application of its CEQA Guidance, and will explain how the Court of Appeal departed from the Air District's long-standing CEQA Guidance in addressing criteria pollutants and toxic air contaminants in this amicus brief.

2. How the Proposed Amicus Curiae Brief Will Assist the Court

As counsel for the proposed amicus curiae, we have reviewed the briefs filed in this action. In addition to serving as a "commentary agency" for CEQA purposes over the Friant Ranch project, the Air District has a strong interest in assuring that CEQA is used for its intended purpose, and believes that this Court would benefit from additional briefing explaining the distinction between criteria pollutants and toxic air contaminants and the different methodologies employed by local air pollution control agencies such as the Air District to analyze these two categories of air pollutants under CEQA. The Air District will also explain how the Court of Appeal's opinion is based upon a fundamental misunderstanding of these two different approaches by requiring the County of Fresno to correlate the project's *criteria* pollution emissions with *local* health impacts. In doing

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[6] CEQA does not require speculation. *See, e.g., Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.*, 6 Cal. 4th 1112, 1137 (1993) (upholding EIR that failed to evaluate cumulative toxic air emission increases given absence of any acceptable means for doing so).

so, the Air District will provide helpful analysis to support its position that at least insofar as criteria pollutants are concerned, CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible.

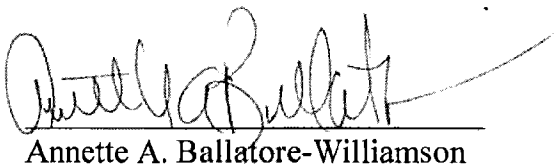
Rule 8.520 Disclosure

Pursuant to Cal. R. 8.520(f)(4), neither the Plaintiffs nor the Defendant or Real Party In Interest or their respective counsel authored this brief in whole or in part. Neither the Plaintiffs nor the Defendant or Real Party in Interest or their respective counsel made any monetary contribution towards or in support of the preparation of this brief.

CONCLUSION

On behalf of the San Joaquin Valley Unified Air Pollution Control District, we respectfully request that this Court accept the filing of the attached brief.

Dated: April 2, 2015



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SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

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I. INTRODUCTION.

The San Joaquin Valley Unified Air Pollution Control District ("Air District") respectfully submits that the Court of Appeal erred when it held that the air quality analysis contained in the Environmental Impact Report ("EIR") for the Friant Ranch development project was inadequate under the California Environmental Quality Act ("CEQA") because it did not include an analysis of the correlation between the project's criteria air pollutants and the potential adverse human health impacts. A close reading of the portion of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants and criteria air pollutants.

Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants (hereinafter referred to as "TACs") regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health,

they are distinguishable from TACs and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of TACs occurs solely under section 112 of the Act. *Compare* 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 *with* 42 U.S.C. § 7411.

The most relevant difference between criteria pollutants and TACs for purposes of this case is the manner in which human health impacts are accounted for. While it is common practice to analyze the correlation between an individual facility's TAC emissions and the expected localized human health impacts, such is not the case for criteria pollutants. Instead, the human health impacts associated with criteria air pollutants are analyzed and taken into consideration when EPA sets the national ambient air quality standard ("NAAQS") for each criteria pollutant. 42 U.S.C. § 7409(b)(1). The health impact of a particular criteria pollutant is analyzed on a regional and not a facility level based on how close the area is to complying with (attaining) the NAAQS. Accordingly, while the type of individual facility / health impact analysis that the Court of Appeal has required is a customary practice for TACs, it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task.

It is clear from a reading of both the administrative record and the Court of Appeal's decision that the Court did not have the expertise to fully

appreciate the difference between TACs and criteria air pollutants. As a result, the Court has ordered the County of Fresno to conduct an analysis that is not practicable and not likely yield valid information. The Air District respectfully requests that this portion of the Court of Appeal's decision be reversed.

II. THE COURT OF APPEAL ERRED IN FINDING THE FRIANT RANCH EIR INADEQUATE FOR FAILING TO ANALYZE THE SPECIFIC HUMAN HEALTH IMPACTS ASSOCIATED CRITERIA AIR POLLUTANTS.

Although the Air District does not take lightly the amount of air emissions at issue in this case, it submits that the Court of Appeal got it wrong when it required Fresno County to revise the Friant Ranch EIR to include an analysis correlating the criteria air pollutant emissions associated with the project with specific, localized health-impacts. The type of analysis the Court of Appeal has required will not yield reliable information because currently available modeling tools are not well suited for this task. Further, in reviewing this issue de novo, the Court of Appeal failed to appreciate that it lacked the scientific expertise to appreciate the significant differences between a health risk assessment commonly performed for toxic air contaminants and a similar type of analysis it felt should have been conducted for criteria air pollutants.

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A. Currently Available Modeling Tools are not Equipped to Provide a Meaningful Analysis of the Correlation between an Individual Development Project's Air Emissions and Specific Human Health Impacts.

In order to appreciate the problematic nature of the Court of Appeals' decision requiring a health risk type analysis for criteria air pollutants, it is important to understand how the relevant criteria pollutants (ozone and particulate matter) are formed, dispersed and regulated.

Ground level ozone (smog) is not directly emitted into the air, but is formed when precursor pollutants such as oxides of nitrogen (NOx) and volatile organic compounds (VOCs) are emitted into the atmosphere and undergo complex chemical reactions in the process of sunlight.[1] Once formed, ozone can be transported long distances by wind.[2] Because of the complexity of ozone formation, a specific tonnage amount of NOx or VOCs emitted in a particular area does not equate to a particular concentration of ozone in that area. In fact, even rural areas that have relatively low tonnages of emissions of NOx or VOCs can have high levels of ozone concentration simply due to wind transport.[3] Conversely, the San Francisco Bay Area has six times more NOx and VOC emissions per square mile than the San Joaquin Valley, but experiences lower

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[1] *See* United States Environmental Protection Agency, *Ground-level Ozone: Basic Information*, available at: http://www.epa.gov/airquality/ozonepollution/basic.html (visited March 10, 2015).
[2] *Id.*
[3] *Id.*

concentrations of ozone (and better air quality) simply because sea breezes disperse the emissions.[4]

Particulate matter ("PM") can be divided into two categories: directly emitted PM and secondary PM.[5] While directly emitted PM can have a localized impact, the tonnage emitted does not always equate to the local PM concentration because it can be transported long distances by wind.[6] Secondary PM, like ozone, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur dioxides (SOx) and NOx.[7] Because of the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area.

The disconnect between the *tonnage* of precursor pollutants (NOx, SOx and VOCs) and the *concentration* of ozone or PM formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects, but the concentration of resulting ozone or PM. Indeed, the national ambient air quality standards ("NAAQS"), which are statutorily required to be set by the United States Environmental Protection

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[4] *San Joaquin Valley Air Pollution Control District 2007 Ozone Plan*, Executive Summary p. ES-6, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/03%20Executive%20Summary.pdf (visited March 10, 2015).

[5] United States Environmental Protection Agency, *Particulate Matter: Basic Information*, available at: http://www.epa.gov/airquality/particlepollution/basic.html (visited March 10, 2015).

[6] *Id.*

[7] *Id.*

Agency ("EPA") at levels that are "requisite to protect the public health," 42 U.S.C. § 7409(b)(1), are established as concentrations of ozone or particulate matter and not as tonnages of their precursor pollutants.[8]

Attainment of a particular NAAQS occurs when the concentration of the relevant pollutant remains below a set threshold on a consistent basis throughout a particular region. For example, the San Joaquin Valley attained the 1-hour ozone NAAQS when ozone concentrations remained at or below 0.124 parts per million Valley-wide on 3 or fewer days over a 3-year period.[9] Because the NAAQS are focused on achieving a particular concentration of pollution region-wide, the Air District's tools and plans for attaining the NAAQS are regional in nature.

For instance, the computer models used to simulate and predict an attainment date for the ozone or particulate matter NAAQS in the San Joaquin Valley are based on regional inputs, such as regional inventories of precursor pollutants (NOx, SOx and VOCs) and the atmospheric chemistry and meteorology of the Valley.[10] At a very basic level, the models simulate future ozone or PM levels based on predicted changes in precursor

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[8] See, e.g., United States Environmental Protection Agency, *Table of National Ambient Air Quality Standards*, available at: http://www.epa.gov/air/criteria.html#3 (visited March 10, 2015).

[9] *San Joaquin Valley Unified Air Pollution Control District 2013 Plan for the Revoked 1-Hour Ozone Standard*, Ch. 2 p. 2-16, available at: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/02Chapter2ScienceTrendsModeling.pdf (visited March 10, 2015).

[10] *Id.* at Ch. 2 p. 2-19 (visited March 12, 2015); *San Joaquin Valley Unified Air Pollution Control District 2008 PM2.5 Plan*, Appendix F, pp. F-2 – F-5, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Final_Adopted_PM2.5/20%20Appendix%20F.pdf (visited March 19, 2015).

emissions Valley wide.[11] Because the NAAQS are set levels necessary to protect human health, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.

The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the date that the Valley attains the NAAQS. Rather, the Air District's modeling and planning strategy is regional in nature and based on the extent to which *all* of the emission-generating sources in the Valley (current and future) must be controlled in order to reach attainment.[12]

Accordingly, the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the Valley can accommodate without affecting the attainment date for the NAAQS.[13] The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources permitted by the Air District must "offset" their emissions.[14] This "offset"

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[11] *Id.*

[12] Although the Air District does have a dispersion modeling tool used during its air permitting process that is used to predict whether a particular project's directly emitted PM will either cause an exceedance of the PM NAAQS or contribute to an existing exceedance, this model bases the prediction on a worst case scenario of emissions and meteorology and has no provision for predicting any associated human health impacts. Further, this analysis is only performed for stationary sources (factories, oil refineries, etc.) that are required to obtain a New Source Review permit from the Air District and not for development projects such as Friant Ranch over which the Air District has no preconstruction permitting authority. *See* San Joaquin Valley Unified Air Pollution Control District Rule 2201 §§ 2.0; 3.3.9; 4.14.1, available at: http://www.valleyair.org/rules/currntrules/Rule2201041l.pdf (visited March 19, 2015).

[13] *San Joaquin Valley Unified Air Pollution Control District Guide to Assessing and Mitigating Air Quality Impacts*, (March 19, 2015) p. 22, available at: http://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf (visited March 30, 2015).

[14] *Id.* at pp. 22, 25.

level allows for growth while keeping the cumulative effects of all new sources at a level that will not impede attainment of the NAAQS.[15] In the Valley, these thresholds are 15 tons per year of PM, and 10 tons of NOx or VOC per year. *Sierra Club*, *supra*, 172 Cal.Rptr.3d at 303; AR 4554. Thus, the CEQA air quality analysis for criteria pollutants is not really a localized, project-level impact analysis but one of regional, "cumulative impacts."

Accordingly, the significance thresholds applied in the Friant Ranch EIR (15 tons per year of PM and 10 tons of NOx or VOCs) are not intended to be indicative of any localized human health impact that the project may have. While the health effects of air pollution are of primary concern to the Air District (indeed, the NAAQS are established to protect human health), the Air District is simply not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual CEQA project directly impact human health in a particular area. This is true even for projects with relatively high levels of emissions of criteria pollutant precursor emissions.

For instance, according to the EIR, the Friant Ranch project is estimated to emit 109.52 tons per year of ROG (VOC), 102.19 tons per year of NOx, and 117.38 tons per year of PM. Although these levels well

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[15] [15] *San Joaquin Valley Unified Air Pollution Control District Environmental Review Guidelines* (Aug. 2000) p. 4-11, available at: http://www.valleyair.org/transportation/CEQA%20Rules/ERG%20Adopted%20_August%202000_.pdf (visited March 12, 2015).

exceed the Air District's CEQA significance thresholds, this does not mean that one can easily determine the concentration of ozone or PM that will be created at or near the Friant Ranch site on a particular day or month of the year, or what specific health impacts will occur. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM. This is especially true for a project like Friant Ranch where most of the criteria pollutant emissions derive not from a single "point source," but from area wide sources (consumer products, paint, etc.) or mobile sources (cars and trucks) driving to, from and around the site.

In addition, it would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have. As discussed above, the currently available modeling tools are equipped to model the impact of *all* emission sources in the Valley on attainment. According to the most recent EPA-approved emission inventory, the NOx inventory for the Valley is for the year 2014 is 458.2 tons per day, or 167,243 tons per year and the VOC (or ROG) inventory is 361.7 tons per day, or 132,020.5 tons per year.[16] Running the photochemical grid model used for predicting ozone attainment with the

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[16] *San Joaquin Valley Unified Air Pollution Control District 2007 Ozone Plan*, Appendix B pp. B-6, B-9,
available at:
http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/19%20Appendix%20B%20April%202007.pdf (visited March 12, 2015).

emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NOx and VOC in the Valley) is not likely to yield valid information given the relative scale involved.

Finally, even once a model is developed to accurately ascertain local increases in concentrations of photochemical pollutants like ozone and some particulates, it remains impossible, using today's models, to correlate that increase in concentration to a specific health impact. The reason is the same: such models are designed to determine regional, population-wide health impacts, and simply are not accurate when applied at the local level.

For these reasons, it is not the norm for CEQA practitioners, including the Air District, to conduct an analysis of the localized health impacts associated with a project's criteria air pollutant emissions as part of the EIR process. When the accepted scientific method precludes a certain type of analysis, "the court cannot impose a legal standard to the contrary." *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 717 n. 8. However, that is exactly what the Court of Appeal has done in this case. Its decision upends the way CEQA air quality analysis of criteria pollutants occurs and should be reversed.

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B. The Court of Appeal Improperly Extrapolated a Request for a Health Risk Assessment for Toxic Air Contaminants into a Requirement that the EIR contain an Analysis of Localized Health Impacts Associated with Criteria Air Pollutants.

The Court of Appeal's error in requiring the new health impact analysis for criteria air pollutants clearly stems from a misunderstanding of terms of art commonly used in the air pollution field. More specifically, the Court of Appeal (and Appellants Sierra Club et al.) appear to have confused the health risk analysis ("HRA") performed to determine the health impacts associated with a project's toxic air contaminants ("TACs"), with an analysis correlating a project's criteria air pollutants (ozone, PM and the like) with specific localized health impacts.

The first type of analysis, the HRA, is commonly performed during the Air District's stationary source permitting process for projects that emit TACs and is, thus, incorporated into the CEQA review process. An HRA is a comprehensive analysis to evaluate and predict the dispersion of TACs emitted by a project and the potential for exposure of human populations. It also assesses and quantifies both the individual and population-wide health risks associated with those levels of exposure. There is no similar analysis conducted for criteria air pollutants. Thus, the second type of analysis (required by the Court of Appeal), is not currently part of the Air District's process because, as outlined above, the health risks associated

with exposure to criteria pollutants are evaluated on a regional level based on the region's attainment of the NAAQS.

The root of this confusion between the types of analyses conducted for TACs versus criteria air pollutants appears to stem from a comment that was presented to Fresno County by the City of Fresno during the administrative process.

In its comments on the draft EIR, the City of Fresno (the only party to raise this issue) stated:

> [t]he EIR must disclose the human health related effects of the Project's air pollution impacts. (CEQA Guidelines section 15126.2(a).) The EIR fails completely in this area. The EIR should be revised to disclose and determine the significance of TAC impacts, and of human health risks due to exposure to Project-related air emissions.

(AR 4602.)

In determining that the issue regarding the correlation between the Friant Ranch project's criteria air pollutants and adverse health impacts was adequately exhausted at the administrative level, the Court of Appeal improperly read the first two sentences of the City of Fresno's comment in isolation rather than in the context of the entire comment. *See Sierra Club v. County of Fresno* (2014) 172 Cal.Rptr.3d 271, 306. Although the comment first speaks generally in terms of "human health related effects" and "air pollution," it requests only that the EIR be revised to disclose "the significance of TACs" and the "human health risks due to exposure."

The language of this request in the third sentence of the comment is significant because, to an air pollution practitioner, the language would only have indicated only that a HRA for TACs was requested, and not a separate analysis of the health impacts associated with the project's criteria air pollutants. Fresno County clearly read the comment as a request to perform an HRA for TACs and limited its response accordingly. (AR 4602.)[17] The Air District submits that it would have read the City's comment in the same manner as the County because the City's use of the terms "human health risks" and "TACs" signal that an HRA for TACs is being requested. Indeed, the Air District was also concerned that an HRA be conducted, but understood that it was not possible to conduct such an analysis until the project entered the phase where detailed site specific information, such as the types of emission sources and the proximity of the sources to sensitive receptors became available. (AR 4553.)[18] The City of Fresno was apparently satisfied with the County's discussion of human health risks, as it did not raise the issue again when it commented on the final EIR. (AR 8944 – 8960.)

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[17] Appellants do not challenge the manner in which the County addressed TACs in the EIR. (Appellants' Answer Brief p. 28 fn. 7.)

[18] Appellants rely on the testimony of Air District employee, Dan Barber, as support for their position that the County should have conducted an analysis correlating the project's criteria air pollutant emissions with localized health impacts. (Appellants Answer Brief pp. 10-11; 28.) However, Mr. Barber's testimony simply reinforces the Air District's concern that a risk assessment (HRA) be conducted once the actual details of the project become available. (AR 8863.) As to criteria air pollutants, Mr. Barber's comments are aimed at the Air District's concern about the amount of emissions and the fact that the emissions will make it "more difficult for Fresno County and the Valley to reach attainment which means that the health of Valley residents maybe [sic] adversely impacted." Mr. Barber says nothing about conducting a separate analysis of the localized health impacts the project's emissions may have.

The Court of Appeal's holding, which incorrectly extrapolates a request for an HRA for TACs into a new analysis of the localized health impacts of the project's criteria air pollutants, highlights two additional errors in the Court's decision.

First, the Court of Appeal's holding illustrates why the Court should have applied the deferential substantial evidence standard of review to the issue of whether the EIR's air quality analysis was sufficient. The regulation of air pollution is a technical and complex field and the Court of Appeal lacked the expertise to fully appreciate the difference between TACs and criteria air pollutants and tools available for analyzing each type of pollutant.

Second, it illustrates that the Court likely got it wrong when it held that the issue regarding the criteria pollutant / localized health impact analysis was properly exhausted during the administrative process. In order to preserve an issue for the court, '[t]he "exact issue" must have been presented to the administrative agency....' [Citation.] *Citizens for Responsible Equitable Environmental Development v. City of San Diego*, (2011) 196 Cal.App.4th 515, 527 129 Cal.Rptr.3d 512, 521; *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 535, 78 Cal.Rptr.3d 1, 13. "'[T]he objections must be sufficiently specific so that the agency has the

opportunity to evaluate and respond to them.' [Citation.]" *Sierra Club v. City of Orange*,163 Cal.App.4th at 536.[19]

As discussed above, the City's comment, while specific enough to request a commonly performed HRA for TACs, provided the County with no notice that it should perform a new type of analysis correlating criteria pollutant tonnages to specific human health effects. Although the parties have not directly addressed the issue of failure to exhaust administrative remedies in their briefs, the Air District submits that the Court should consider how it affects the issues briefed by the parties since "[e]xhaustion of administrative remedies is a jurisdictional prerequisite to maintenance of a CEQA action." *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1199, 22 Cal.Rptr.3d 203.

III. CONCLUSION

For all of the foregoing reasons, the Air District respectfully requests that the portion of the Court of Appeal's decision requiring an analysis correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

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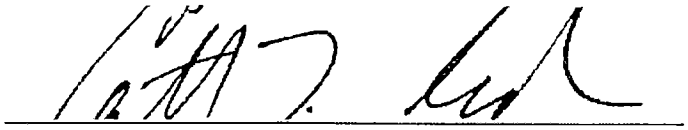
[19] *Sierra Club v. City of Orange*, is illustrative here. In that case, the plaintiffs challenged an EIR approved for a large planned community on the basis that the EIR improperly broke up the various environmental impacts by separate project components or "piecemealed" the analysis in violation of CEQA. In evaluating the defense that the plaintiffs had failed to adequately raise the issue at the administrative level, the Court held that comments such as *"the use of a single document for both a project-level and a program-level EIR [is] 'confusing',"* and *"[t]he lead agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project,"* were too vague to fairly raise the argument of piecemealing before the agency. *Sierra Club v. City of Orange*, 163 Cal.App.4th at 537.

correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

Respectfully submitted,

Dated: April 2, 2015



Catherine T. Redmond
Attorney for Proposed Amicus Curiae

SAN JOAQUIN VALLEY
UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.204 of the California Rules of Court, I hereby certify that this document, based on the Word County feature of the Microsoft Word software program used to compose and print this document, contains, exclusive of caption, tables, certificate of word count, signature block and certificate of service, 3806 words.

Dated: April 2, 2015

Annette A. Ballatore-Williamson
District Counsel (SBN 192176)

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

PROOF OF SERVICE

I am over the age of 18 years and not a p[arty to the above-captioned action; that my business address is San Joaquin Valley Unified Air Pollution Control District located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

On April 2, 2015, I served the document described below:

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO

On all parties to this action at the following addresses and in the following manner:

PLEASE SEE ATTACHED SERVICE LIST

(XX) **(BY MAIL)** I caused a true copy of each document(s) to be laced in a sealed envelope with first-class postage affixed and placed the envelope for collection. Mail is collected daily at my office and placed in a United State Postal Service collection box for pick-up and delivery that same day.

( ) **(BY ELECTRONIC MAIL)** I caused a true and correct scanned image (.PDF file) copy to be transmitted via electronic mail transfer system in place at the San Joaquin Valley Unified Air Pollution Control District ("District"), originating from the undersigned at 1990 E. Gettysburg Avenue, Fresno, CA, to the address(es) indicated below.

( ) **(BY OVERNIGHT MAIL)** I caused a true and correct copy to be delivered via Federal Express to the following person(s) or their representative at the address(es) listed below.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I executed this document on April 2, 2015, at Fresno, California.

Esthela Soto

SERVICE LIST

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

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Appendix 5.4-1 Contra Costa County General Plan Update: Biological Resources Existing Conditions Report

Appendices

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DRAFT

CONTRA COSTA COUNTY GENERAL PLAN UPDATE: BIOLOGICAL RESOURCES EXISTING CONDITIONS REPORT

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JANUARY 2019

ICF. 2019. *Contra Costa County General Plan Update: Biological Resources Existing Conditions Report*. Draft. January. (ICF 671.18.) San Jose, CA. Prepared for Contra Costa County Department of Conservation and Development, Martinez, CA.

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Abbreviations and Acronyms

BPPA	Botanical Priority Protection Area
CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
Conservancy	East Contra Costa County Habitat Conservancy
Delta	Sacramento River–San Joaquin River Delta
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Parks District
Existing Conditions Report	Contra Costa County General Plan Update: Biological Resources Existing Conditions Report
2005–2020 General Plan	Contra Costa County General Plan 2005–2020
HCP/NCCP or Plan	East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan
USFWS	U.S. Fish and Wildlife Service

Chapter 1
Introduction

This *Contra Costa County General Plan Update: Biological Resources Existing Conditions Report* (Existing Conditions Report) describes and maps existing biological resources conditions in Contra Costa County. The county covers 516,187 acres and includes 19 incorporated cities and towns.

This Existing Conditions Report documents the following:

- Regulatory jurisdictions,
- Protected areas,
- Ecoregions,
- Watersheds,
- Natural communities and land cover types,
- Special-status species,
- Wildlife corridors, and
- Sensitive habitats.

This report is intended to support both preparation of the *Contra Costa County General Plan Update*, which will include a comprehensive review of and update to *Contra Costa County General Plan 2005–2020* (2005–2020 General Plan), and analysis of impacts on existing biological resources within the General Plan 2020 Environmental Impact Report. In addition to describing existing biological resources within the county, this report also provides an overview of the regulatory context for the General Plan 2020 planning area.

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Chapter 2
Open Space

This chapter describes existing conditions within the county's open space lands. Open space lands are classified natural or semi-developed areas that are at least partially open to recreation. This chapter also describes open space land in terms of protected areas and land ownership as well as the ecoregions, watersheds, and vegetation communities therein.

Natural Environment

The county is a unique area where the greater San Francisco Bay Area, Sacramento River–San Joaquin River Delta (Delta), and Central Valley meet. Elevations range from at or below sea level (e.g., in the marshes adjacent to the Delta) to 3,849 feet at the peak of Mount Diablo, the highest point in the county. The physiography of the county is dominated by Mount Diablo and its surrounding hill slopes/valleys, which generally trend northwest/southeast according to local structure/faulting; lower valleys; and plains that transition to the San Francisco Bay/Delta zones.

Urban development is dense in the western and northern portions of the county, especially adjacent to San Francisco Bay, while the eastern and southern portions of the county are made up of unincorporated rural (i.e., sparser) developments. The unincorporated areas of the county are primarily rural agricultural and public lands and used principally for grazing, open space, and watershed protection (Jones & Stokes 2006). The rural lands are the focus of this chapter.

Regulatory Jurisdictions

The three main levels of regulatory jurisdiction that own and manage the approximately 150,000 acres of rural lands across the county are local, state, and federal (Figure 2-1).

Local

There are 35 landowners at the local level. Landowners include special districts, such as the East Bay Regional Parks District (EBRPD), East Bay Municipal Utility District (EBMUD), and Contra Costa Water District; counties; cities; non-profit organizations, such as Save Mount Diablo, Port Costa Conservation Society, and John Muir Land Trust; and school districts. Most of these landowners manage lands that function as parks and open spaces, but locally owned land also includes semi-developed areas such as dog parks, swim centers, horticultural gardens, and track and field complexes (California Protected Areas Database 2018). Approximately 115,925 acres of land in the county is locally owned.

The three landowners that own the most land in the county are the EBRPD, EBMUD and the Contra Costa Water District. EBRPD land comprises the majority of recreational open space within the county. The EBRPD manages approximately 121,397 acres of regional parkland across both East San Francisco Bay counties (i.e., Contra Costa County and Alameda County) (East Bay Regional Parks District 2018a), of which 57,185 acres are in Contra Costa County (California Protected Areas Database 2018). The parks differ in type, from regional parks to regional trails, regional preserves,

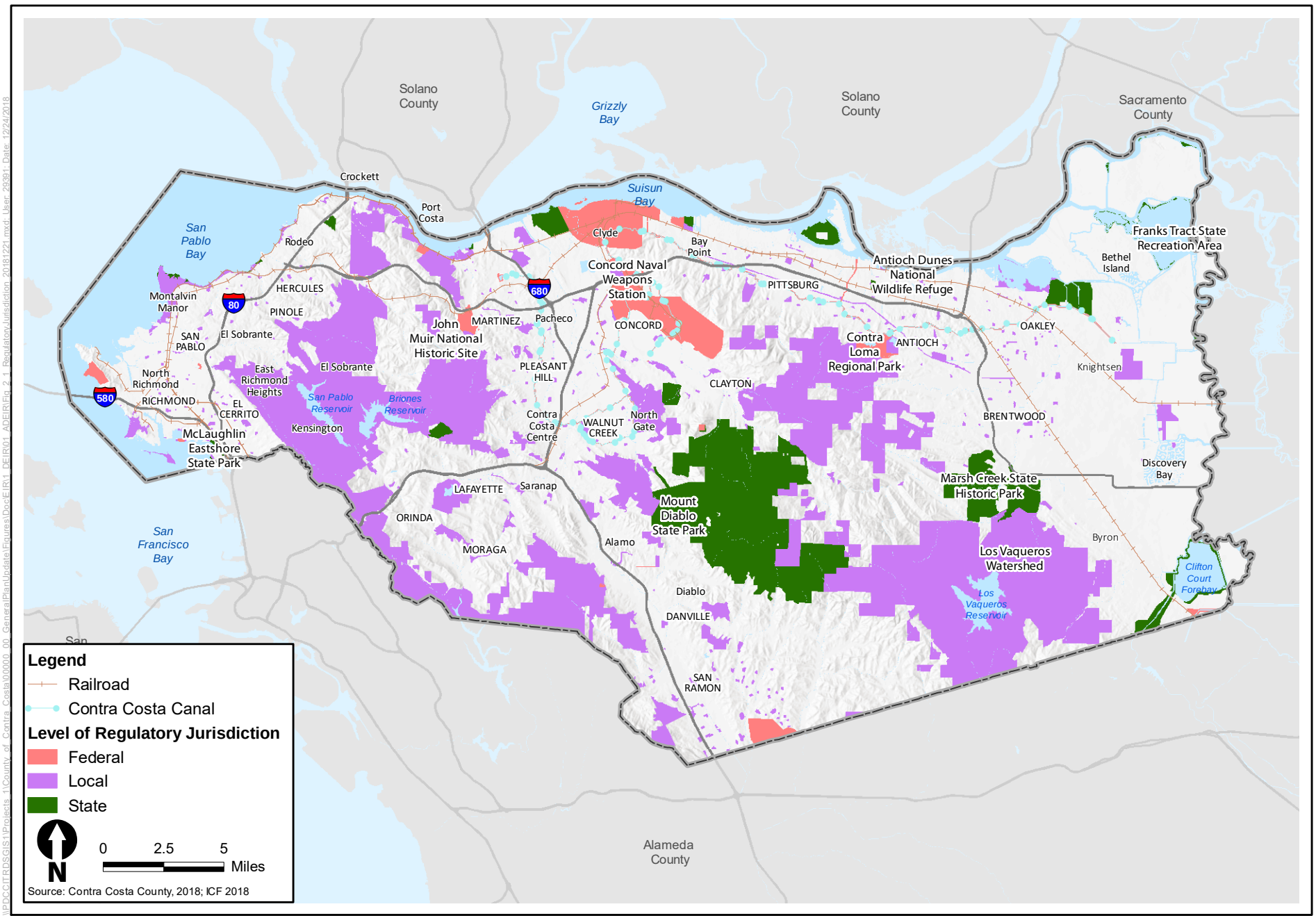

Figure 2-1
Regulatory Jurisdiction

regional recreation areas, regional shorelines, regional wilderness areas, and regional open spaces (Contra Costa County Department of Conservation and Development 2005). The EBRPD maintains internal trail systems in addition to the parks and open spaces within or partially within the county.

The EBMUD is a water district that, similar to the EBRPD, services both Contra Costa and Alameda Counties. The EBMUD owns and operates 26,758 acres of land in the county. Much of the EBMUD land is open to recreation, such as Lafayette Reservoir, Briones Reservoir, or the San Pablo Reservoir Recreation Area. It also includes the Delta De Anza Regional Trail and Mokelumne Trail (California Protected Areas Database 2018). The Contra Costa Water District owns and manages the Los Vaqueros Watershed, which is an approximately 20,000-acre open space area surrounding the 1,500-acre Los Vaqueros Reservoir in the eastern portion of the county (Contra Costa Water District 2018).

State

State-level landowners include the California Department of Parks and Recreation, California State Lands Commission, California Department of Fish and Wildlife (CDFW), University of California, and California Department of Water Resources. The California Department of Parks and Recreation manages five parks within the county. The 20,000-acre Mount Diablo State Park, with its isolated peak at 3,849 feet, is the most well-known state park (California Department of Parks and Recreation 2018), but the smaller Marsh Creek State Historic Park (approximately 3,500 acres), Point Isabel Lighthouse State Historic Site, (51 acres), and Franks Tract State Recreation Area (approximately 3,500 acres) are also within the county (California Protected Areas Database 2018). A small portion of McLaughlin Eastshore State Park (27 acres), which extends 8.5 miles along the East Bay shoreline from the Bay Bridge to Richmond, is also in the county (East Bay Regional Parks District 2018b). The four other owners of state land in the county are listed in Table 2-1. Approximately 31,690 acres of land in the county is state land.

Table 2-1. State Land Ownership in Contra Costa County

Site Name	Acres
California Department of Parks and Recreation	
Mount Diablo State Park	18,822
Marsh Creek Historic Site	3,679
Franks Tract State Recreation Area	2,388
McLaughlin Eastshore State Park	27
Point Isabel Lighthouse State Historic Site	51
California Department of Fish and Wildlife	
Delta Islands	88
Rhode Island Wildlife Area	8
California Department of Water Resources	
Bethany Reservoir State Recreation Area	229
Clifton Court Forebay	3,333
Dutch Slough	1,185

Site Name	Acres
California State Lands Commission	
Bay Point Regional Shoreline	87
Browns Island Regional Shoreline	601
Carquinez Strait	39
Crockett Hills Regional Park	9
Point Edith Wildlife Area	727
Point Pinole Regional Shoreline	112
San Pablo Bay Regional Shoreline	58
University of California	
Russell Research Station	247
Total	**31,690**

California Protected Areas Database, 2018.

Federal

Federal landowners include the U.S. Fish and Wildlife Service, Bureau of Recreation, National Parks Service, U.S. Navy, Bureau of Land Management, and Union Pacific Railroad, as shown in Table 2-2. Federal land is located mainly in the northern portion of the county. Approximately 6,261 acres of land in the county is federal land.

Table 2-2. Federal Land Ownership in Contra Costa County

Site Name	Acres
Bureau of Land Management	
BLM	7
Mount Diablo State Park	41
U.S. Bureau of Reclamation	
Black Diamond Mines	705
Contra Loma Regional Park	62
U.S. Fish and Wildlife Service	
Antioch Dunes National Wildlife Refuge	56
National Park Service	
Eugene O'Neill Historic Site	13
John Muir National Historic Site	9
Mt. Wanda	340
U.S. Navy	
Concord Naval Weapons Station	5,028
Total	**6,261**
Union Pacific Railroad	
Railroad	50 (approximate miles)

California Protected Areas Database, 2018; Surface Management Area, 2018.

Protected Areas

The county contains 145,855 acres of protected areas (28% of the county), comprising land protected in fee title[1] only (136,318acres), through conservation easement[2] only (8,321 acres), or both (1,216 acres) (Figure 2-2). Protected areas are defined as open space reserves that are managed primarily for their ecological functions and values. Lands within the county that fit this definition are owned by the EBRPD, EBMUD, Contra Costa Water District (i.e., Los Vaqueros Watershed), and state (see the *Regulatory Jurisdiction* section, above). Protected areas vary according to the mechanisms by which the land is protected (fee title or conservation easement) and the degree to which land is protected for its ecological values. For example, EBRPD land that is managed in partnership with the East Contra Costa County Habitat Conservancy (Conservancy) (see *East Contra Coast County Habitat Conservation Plan/Natural Community Conservation Plan,* below) is protected under a conservation easement, while EBRPD lands outside the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Inventory Area are protected under a fee title. Some lands are protected primarily for the conservation of natural resources (e.g., wildlife refuges, wilderness areas, conservation and mitigation banks). Other lands are protected for multiple uses, including conservation, light-use recreation (e.g., hiking, wildlife viewing), or more intensive recreation (e.g., off-highway vehicle recreation).

East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan

The East Contra Costa County Habitat Conservation Plan Association developed the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP or Plan), which provides regional conservation and development guidelines to protect natural resources, including wetlands, while improving and streamlining the permit process for take[3] of state and federally listed species. The 30-year Plan was approved at the local level in 2006 and 2007, and permits were issued by the CDFW and the U.S. Fish and Wildlife Service (USFWS) in 2007. The Plan allows Contra Costa County; the Contra Costa County Flood Control and Water Conservation District; the EBRPD; the Cities of Brentwood, Clayton, Oakley, and Pittsburg; and the Conservancy—a group collectively referred to as the *Permittees*—to authorize endangered species permitting for activities and projects in the region, performed or approved by the Permittees, while providing comprehensive species, wetlands, and ecosystem conservation and contributing to the recovery of endangered species in Northern California. The Plan implements a conservation strategy designed to achieve a comprehensive set of biological goals and objectives. Furthermore, as a Natural Community Conservation Plan, the Plan provides for broad-based planning to preserve natural communities at the ecosystem scale (East Contra Costa Habitat Conservancy 2018).

Within the 174,018-acre Plan Inventory Area, the issued permits provide take authorization under the California Natural Community Conservation Planning Act and federal Endangered Species Act for 8,670 to 11,853 acres of urban development and 1,126 acres of rural infrastructure projects. The

[1] Type of land ownership that allows the land owner to use the property in any manner, consistent with local, state, and federal laws and ordinances.

[2] A permanent agreement that restricts the use of land in order to protect its ecological functions and values.

[3] Take, as defined by the Endangered Species Act, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The state's definition of take is to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

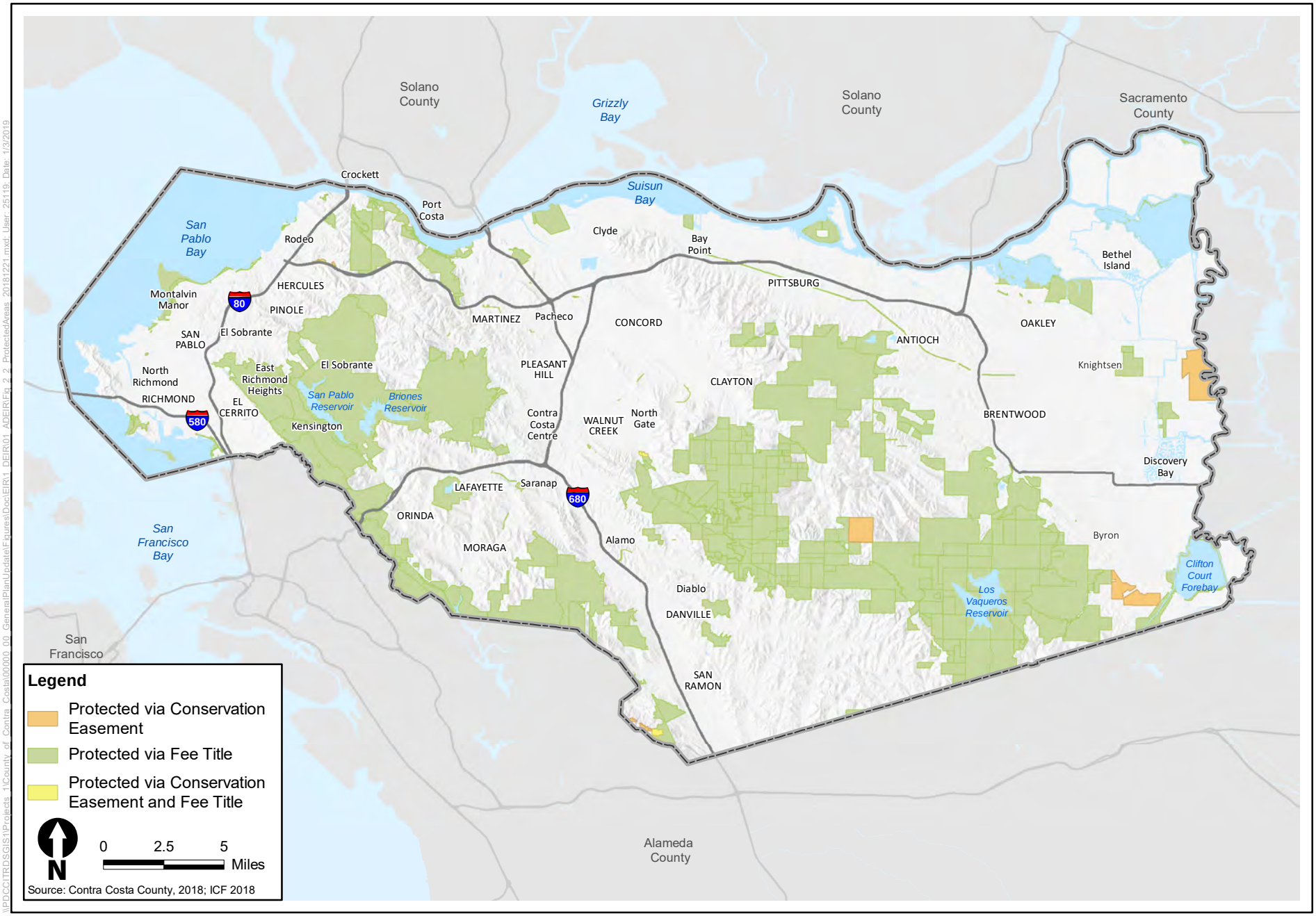

Figure 2-2
Protected Areas

primary means for offsetting these impacts is to conserve and restore lands in a Preserve System, which is land within the Plan Inventory Area that is protected in perpetuity. The Preserve System will ultimately encompass between 23,800 and 30,300 acres of land that will be acquired and managed to benefit the covered species as well as the natural communities that they, and hundreds of other species, depend on for habitat. In areas with active cropland or irrigated pasture, emphasis will be given to acquiring land suitable for restoration of riparian woodland/scrub, while outside of these land uses, emphasis will be given to acquiring property to ensure full protection of resource values and land uses that are compatible with HCP/NCCP biological goals and objectives. During the first 10 years of implementation of the Plan, 36 properties were acquired for the Preserve System, totaling more than 13,809 acres (Figure 2-3). All but one of the acquisitions have been completed in partnership with the EBRPD, which owns these properties and, together with the Conservancy, manages the Preserve System lands (East Contra Costa Habitat Conservancy 2018).

The Plan addresses 28 listed and non-listed species, as shown in Table 2-3. The species were identified on the basis of an initial assessment of the effect of proposed activities and conservation measures on listed species or species that could become listed during the Plan term. The 154 special-status species with the potential to occur in the Plan Inventory Area were evaluated for coverage in the Plan and screened according to specific criteria (see Chapter 3, *Physical and Biological Resources*, Section 3.3.7, *Covered Species*, in the East Contra Costa County HCP/NCCP for additional detail). The Plan includes conservation measures to protect all 28 covered species, whether or not they are currently listed (East Contra Costa Habitat Conservancy 2018).

Ecoregions

Ecoregions are areas of general similarity in ecosystems, based on major terrain features, such as a desert, plateau, valley, mountain range, or a combination thereof (McNab et. al. 2007). Identification is based on patterns of biotic and abiotic phenomena, including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. North America is divided into different ecological units, from coarsest to finest (ecoregions [i.e., provinces], subregions [i.e., sections], landscapes, and land units). Three ecoregions overlap the county: the California Coastal Chaparral Forest and Shrub Province, the California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province, and the California Dry Steppe Province (Figure 2-4). Within each ecoregion is one subregion, with the same boundaries as the previously listed ecoregions (i.e., the Central California Coast Section, the Central California Coast Ranges Section, and the Great Valley Section, respectively). The acreages for each ecoregion are shown in Table 2-4.

California Coastal Chaparral Forest and Shrub Province

The California Coastal Chaparral Forest and Shrub Province overlaps the western and north-central portion of the county. There are 293,887 acres of the California Coastal Chaparral Forest and Shrub Province in the county, covering the western and central portions (see Table 2-4). This province encompasses much of the California coast, from San Francisco to Baja. The primary distinguishing characteristic of this ecoregion is its Mediterranean climate, with hot, dry summers and cool, moist winters. The associated vegetative cover comprises primarily chaparral and woodlands. The landscape is composed of coastal plains and high hills. Large areas of ranchland are grazed by domestic livestock. Relatively little land has been cultivated. The Central California Coast Section, discussed below, occurs within the California Coastal Chaparral Forest and Shrub Province.

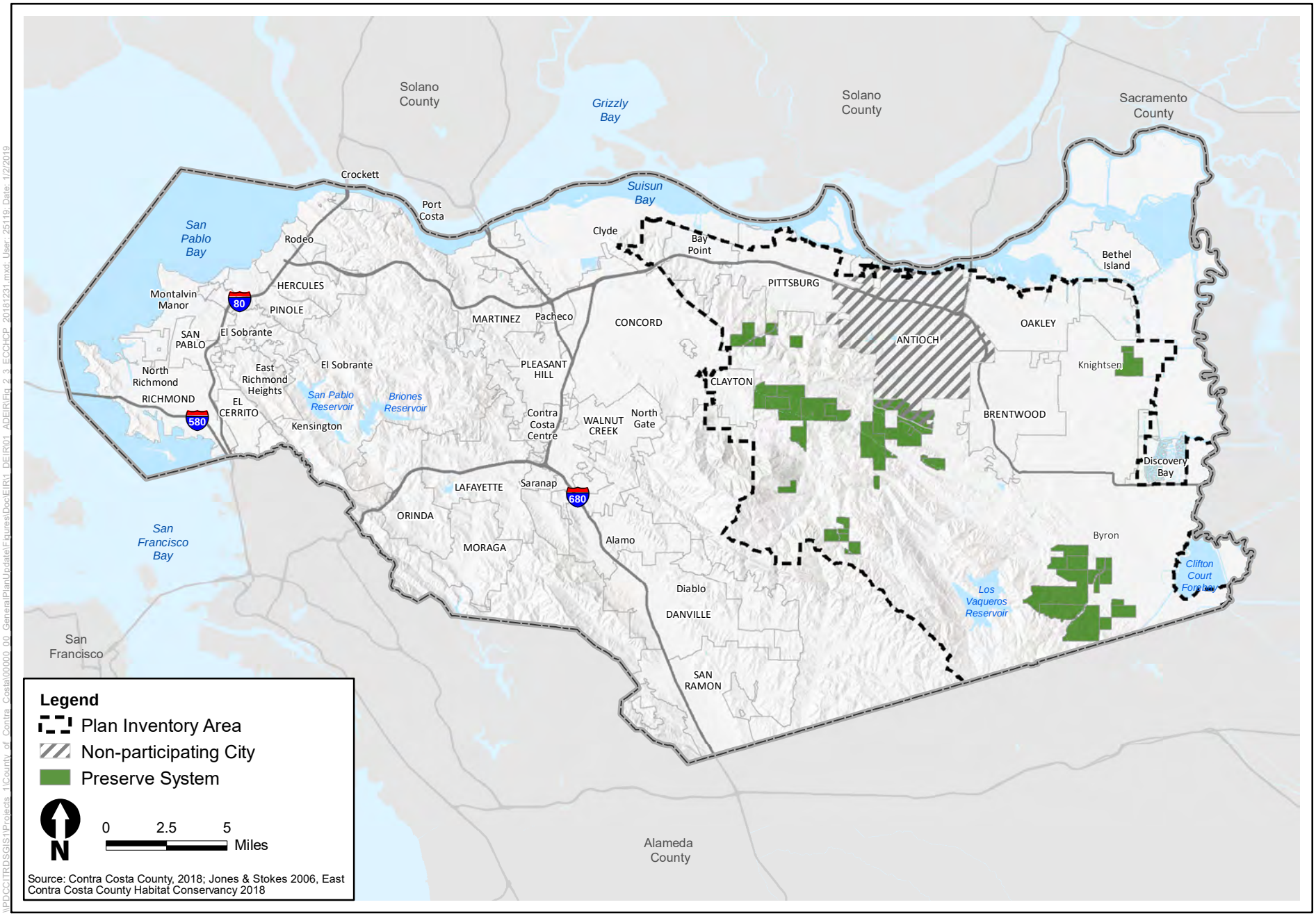

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Figure 2-3

East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan

Table 2-3. Special-Status Species Covered by the East Contra Costa County HCP/NCCP

		Status[1]	
Common Name	**Scientific Name**	**State**	**Federal**
Mammals			
Townsend's big-eared bat	*Corynorhinus townsendii*	CSC	–
San Joaquin kit fox	*Vulpes macrotis mutica*	ST	FE
Birds			
Tricolored blackbird	*Agelaius tricolor*	CE, CSC-1	–
Golden eagle	*Aquila chrysaetos*	FP	BGPA
Western burrowing owl	*Athene cunicularia hypugea*	CSC-1	–
Swainson's hawk	*Buteo swainsoni*	ST	–
Reptiles			
Northern California legless lizard	*Anniella pulchra*	CSC	–
Alameda whipsnake	*Masticophis lateralis euryxanthus*	ST	FT
Giant garter snake	*Thamnophis gigas*	ST	FT
Western pond turtle	*Emys marmorata*	CSC	–
Amphibians			
California tiger salamander	*Ambystoma californiense*	ST	FT
California red-legged frog	*Rana draytonii*	CSC	FT
Foothill yellow-legged frog	*Rana boylii*	CT, CSC	–
Invertebrates			
Longhorn fairy shrimp	*Brachinecta longiantenna*	–	FE
Vernal pool fairy shrimp	*Brachinecta lynchi*	–	FT
Midvalley fairy shrimp	*Brachinecta mesovallensis*	–	–
Vernal pool tadpole shrimp	*Lepidurus packardi*	–	FE
Plants		**CNPS**	
Mount Diablo manzanita	*Arctostaphylos auriculata*	1B	–
Brittlescale	*Atriplex depressa*	1B	–
Big tarplant	*Blepharizonia plumosa*	1B	–
Round-leaved filaree	*California macrophylla*	–	–
Mount Diablo fairy lantern	*Calochortus pulchellus*	1B	–
Recurved larkspur	*Delphinium recurvatum*	1B	–
San Joaquin spearscale	*Extriplex joanquiniana*	1B	–
Diablo helianthella	*Helianthella castanea*	1B	–
Brewer's dwarf flax	*Hesperolinon breweri*	1B	–
Showy madia	*Madia radiata*	1B	–
Adobe navarretia	*Navarretia nigelliformis* ssp. *nigelliformis*	4.2	–

[1] Status:

Federal

FE Federally Endangered
FT Federally Threatened
BGPA Bald and Golden Eagle Protection Act

State

ST State Listed as Threatened

Common Name	Scientific Name	Status[1] State	Status[1] Federal
CSC	California Special Concern Species		
CSC-1	Bird Species of Special Concern; First Priority		
FP	Fully Protected		
CE	Candidate Protected		
CT	Candidate Threatened		
California Native Plant Society			
1B	Rare, Threatened, or Endangered in California and Elsewhere		
4.2	Limited Distribution; Moderately Threatened in California		

Jones & Stokes, 2006.

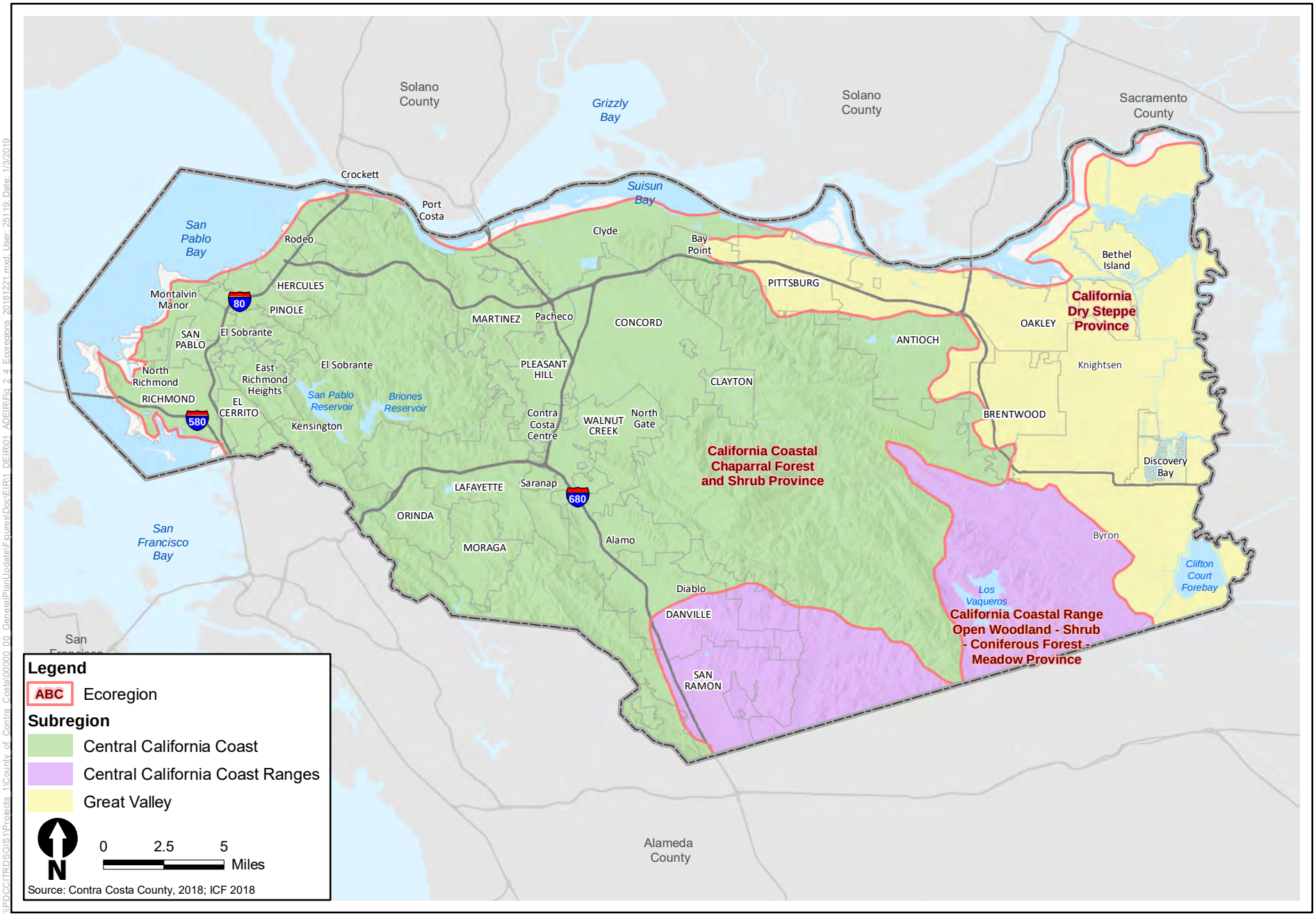

Figure 2-4
Ecoregions and Subregions

Table 2-4. Ecoregions in Contra Costa County

Name	Acres in County
California Coastal Chaparral Forest and Shrub Province	293,887
California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province	67,863
California Dry Steppe Province	104,890

McNab et. al., 2007.

Central California Coast Section

The Central California Coast Section in the county has low to moderate elevations. The bedrock is composed of sedimentary, granitic, and ultramafic formations. The vegetation is a mixture of western hardwoods, chaparral, and California annual grassland land cover types.

California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province

The California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province overlaps the southeastern portion of the county. There are 67,863 acres of California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province in the county, covering the southern portion (see Table 2-4). This province encompasses much of California, from San Francisco to Baja. The ecoregion has a Mediterranean climate, with hot, dry summers and cool, moist winters. Most of the precipitation is rain. The associated vegetative cover comprises evergreen shrubland, with lesser areas of woodland, consisting of broadleaf species, some of which are drought-deciduous. The Central California Coast Ranges Section occurs within the California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province.

Central California Coast Ranges Section

The Central California Coast Ranges Section comprises low-elevation parallel ranges. Rock formations are of marine and non-marine sedimentary origins. The vegetation is western hardwoods, annual grassland, and chaparral.

California Dry Steppe Province

The California Dry Steppe Province overlaps the northeastern corner of the county. There are 104,890 acres of California Dry Steppe Province in the county, covering the eastern portion (see Table 2-4). This province encompasses California's Central Valley, from Redding to Bakersfield. The ecoregion has a Mediterranean climate, with hot, dry summers and mild winters. Most of the precipitation is rain, which falls during the winter. The landscape, with its low hills, is typical of an alluvial plain. The associated vegetative cover was historically herbaceous but is now largely irrigated to support agricultural crops. The Great Valley Section occurs within the California Dry Steppe Province.

Great Valley Section

The Great Valley Section's low-elevation fluvial plain formed on non-marine sedimentary rocks. The land cover has been converted to agricultural, but small areas of natural cover remain, with patches of annual grasses, western hardwoods, and wet grasslands.

Watersheds

Fifteen major watersheds[4] cover approximately 464,660 acres and overlap or occur completely within the county (Figure 2-5). The largest watershed in the county is the Walnut Creek-Frontal Suisun Bay Estuaries. This watershed contains nine San Francisco Bay Area cities: Orinda, Moraga, Danville, San Ramon, Lafayette, Walnut Creek, Pleasant Hill, Concord, and a portion of Martinez. Other sizeable watersheds in the county include the Kellogg Creek-Big Break, San Pablo Creek-Frontal Estuaries, Mount Diablo Creek-Frontal Suisun Bay Estuaries, and Marsh Creek. These watersheds catch precipitation and runoff from storm drains, then carry the water to the San Francisco Bay/Delta system. Water from the urbanized western portion of the county drains directly to San Francisco Bay or San Pablo Bay, while the northern and eastern portions of the county drain into Suisun Bay and the Delta river channels, eventually flowing into San Francisco Bay or San Pablo Bay. The south-central portion of the county is within the Alameda Creek drainage basin; this area's water drains south to Alameda Creek, then west to San Francisco Bay (Contra Costa County 2005).

Because of the Mediterranean climate and its characteristic lack of rainfall during the summer months, ephemeral and intermittent streams are the dominant hydrologic features within the county watersheds. The range of precipitation reflects variations in elevation and proximity to the coast. Surface flow in ephemeral streams is generally supplied by rainfall; these streams flow only during and immediately following rain events. Surface flow in intermittent or seasonal streams is supplied by a combination of rainfall runoff and groundwater; accordingly, these streams generally flow throughout the rainy season and into the late spring or early summer. Perennial streams in the county are also supported by rainfall runoff and groundwater, but unlike seasonal streams, they run year-round, with major dry-season inputs from both natural and artificial sources (e.g., upwelling springs and surface or subsurface flows from local irrigation, respectively) (Jones & Stokes 2006). The major watersheds in the county and the major creeks within each watershed are listed in Table 2-5.

The natural hydrology of many of the major creeks and streams in the urban areas has been altered to control flooding or convey irrigation water. Channels were made wider and deeper and lined with concrete or riprap. Creeks and streams were relocated and realigned to accommodate increased flows, then placed in conduits and culverts (Contra Costa County 2005). Most creeks and streams have been disconnected from their historic floodplains by levees and channelization. Many of these streams are maintained as flood control channels, which support little or no riparian vegetation. Outside the urbanized areas, most drainages remain relatively natural and occupy at least a portion of their historic floodplains. Most of these features are ephemeral or intermittent, however, and generally support narrow floodplains with limited riparian habitat (Jones & Stokes 2006).

[4] Major watersheds are identified at the level of the U.S. Geological Survey's 10-digit Hydrologic Unit Code (HUC 10).

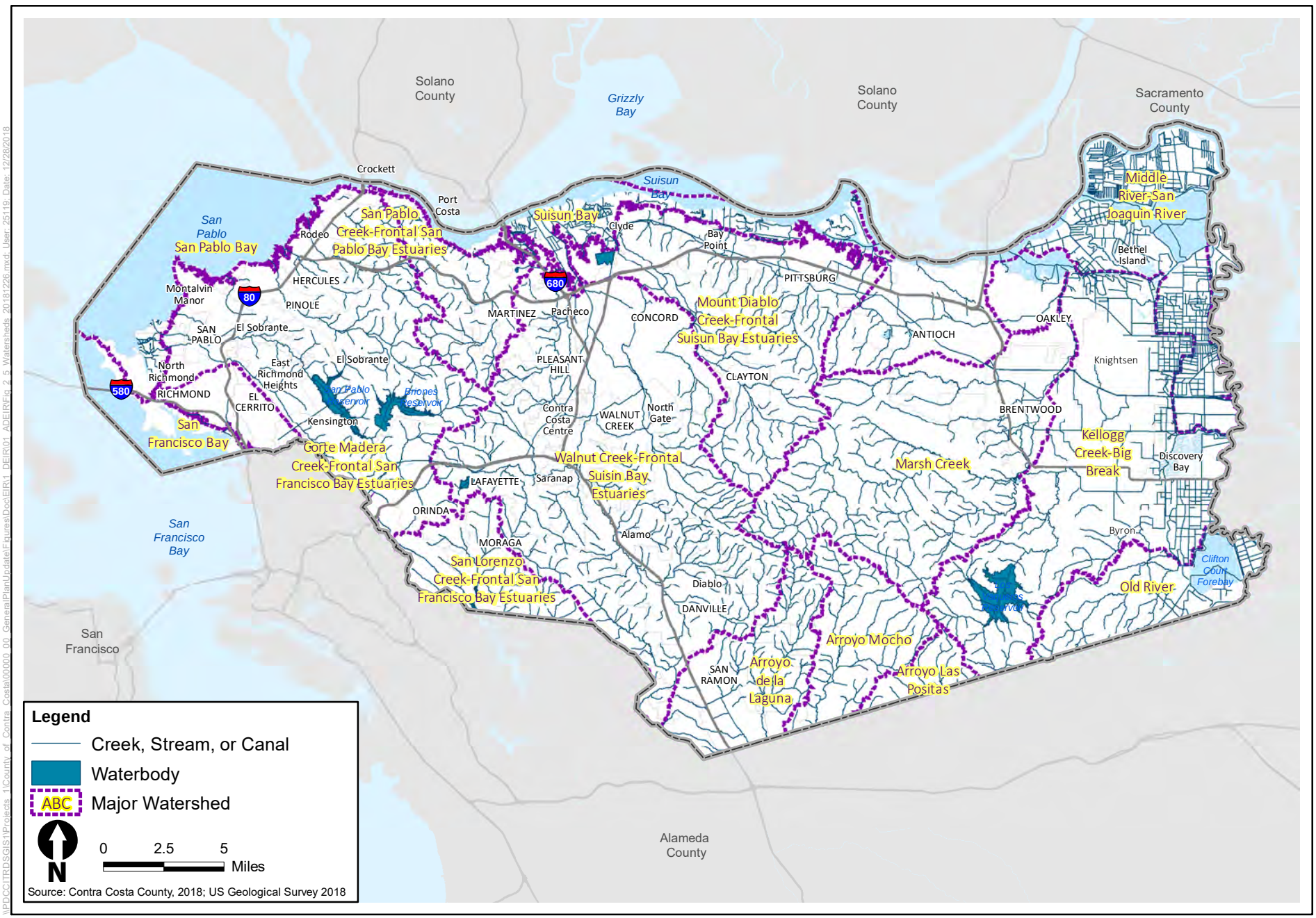

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Figure 2-5
Major Watersheds

Table 2-5. Watersheds in Contra Costa County

Watershed Name	Area of Entire Watershed (acres)	Acres in the County	Major Creeks in Watershed[a] (length in miles)
San Francisco Bay	69,482	9,509	Alameda Creek (1.4) Coyote Hills Slough (0.6) Mount Eden Creek (3.2) Plummer Creek (0.93)
Old River	155,405	1,9195	Brushy Creek (9.9) Mountain House Creek (7.2) Patterson Run (5.5)
San Pablo Bay	146,699	2,5770	Garrity Creek (0.5) Pinole Creek (0.5) Rodeo Creek (0.4) Wildcat Creek (0.4)
Middle River-San Joaquin River	135,876	49,109	San Joaquin River (336)
Suisun Bay	108,281	16,989	Hastings Slough (0.5) Kirker Creek (0.3) Mount Diablo Creek (0.6) Seal Creek (1.6)
San Lorenzo Creek-Frontal San Francisco Bay Estuaries	10,6303	13,151	San Leandro Creek (13.3) San Lorenzo Creek (9.3) Crow Creek (8.5) Cull Creek (7.5)
Walnut Creek-Frontal Suisun Bay Estuaries	92,389	92,317	Las Trampas Creek (11.9) Pine Creek (13.1) San Ramon Creek (12.0) Walnut Creek (7.8)
Kellogg Creek-Big Break	65,833	64,889	Kellogg Creek (13.1)
Arroyo Mocho	62,188	15,917	Arroyo Las Positas (0.9) Arroyo Mocho (24.5) Tarraville Creek (3.9) Tassajara Creek (13.0)
San Pablo Creek-Frontal San Pablo Bay Estuaries	62,108	61,917	Pinole Creek (10.0) Rodeo Creek (7.8) San Pablo Creek (12.7) Wildcat Creek (10.7)
Corte Madera Creek-Frontal San Francisco Bay Estuaries	61,759	6,747	Cerrito Creek (1.6) Claremont Creek (2.0) Codornices Creek (1.3) Temescal Creek (1.6)

Watershed Name	Area of Entire Watershed (acres)	Acres in the County	Major Creeks in Watershed[a] (length in miles)
Mount Diablo Creek-Frontal Suisun Bay Estuaries	58,880	58,873	Donner Creek (3.9) Franklin Creek (4.8) Kirker Creek (8.3) Mount Diablo Creek (13.4)
Marsh Creek	55,881	55,874	Deer Creek (8.3) Marsh Creek (31.0) Sand Creek (11.8) Sycamore Creek (3.7)
Arroyo Las Positas	51,852	4,504	Arroyo Las Positas (5.5) Arroyo Seco (9.9) Cayetano Creek (6.8) Cottonwood Creek (5.2)
Arroyo de la Laguna	47,079	19,009	Alamo Creek (10.0) Arroyo de la Laguna (6.3) Sinbad Creek (7.3) West Branch Alamo Creek (7.8)
Total	**1,280,014**	**464,660[b]**	**—**

a. Includes up to four of the longest creeks in each watershed; this is not a comprehensive list of all creeks in each watershed.

b. The total does not equal the size of the county because the county boundary extends into San Francisco Bay and the Delta.

U.S. Geological Survey, 2018.

Natural Communities and Land Cover Types

The county contains a diverse range of flora, from montane plant communities atop Mount Diablo to the saline plant communities of the San Francisco Bay estuaries. Natural communities are the assemblage of species that co-occur in the same habitat or area and interact through trophic and spatial relationships. Natural communities are defined by the land cover types, which are typically characterized one or more dominant species. A total of nine natural communities and 41 land cover types are found in the county (Figures 2-6 and 2-7).

The size of each natural community and land cover type is listed in Table 2-6. Excluding urban development, the predominant land cover type in the county is California annual grassland, which is abundant in the unincorporated portions of the eastern county.

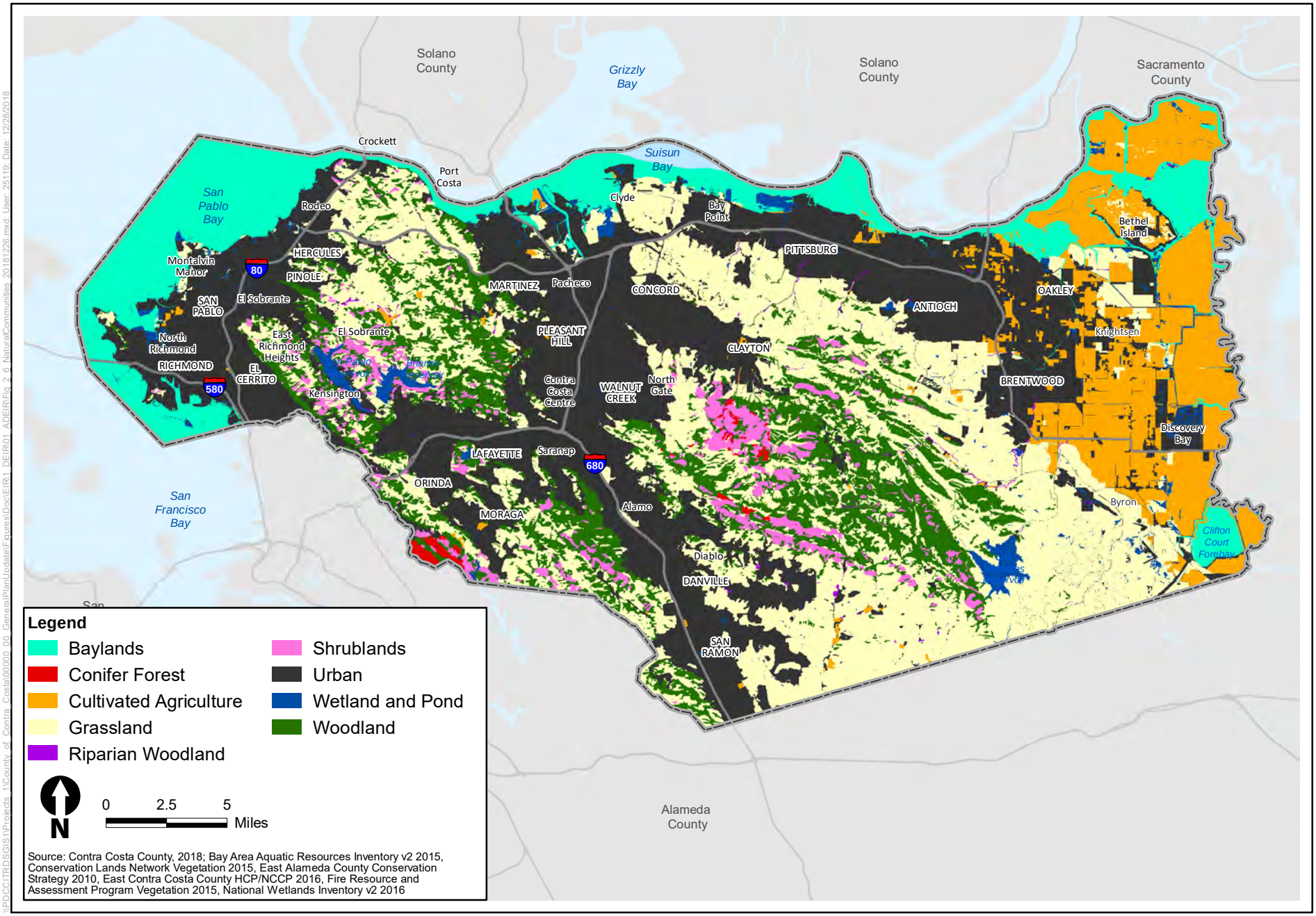

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Figure 2-6
Natural Communities

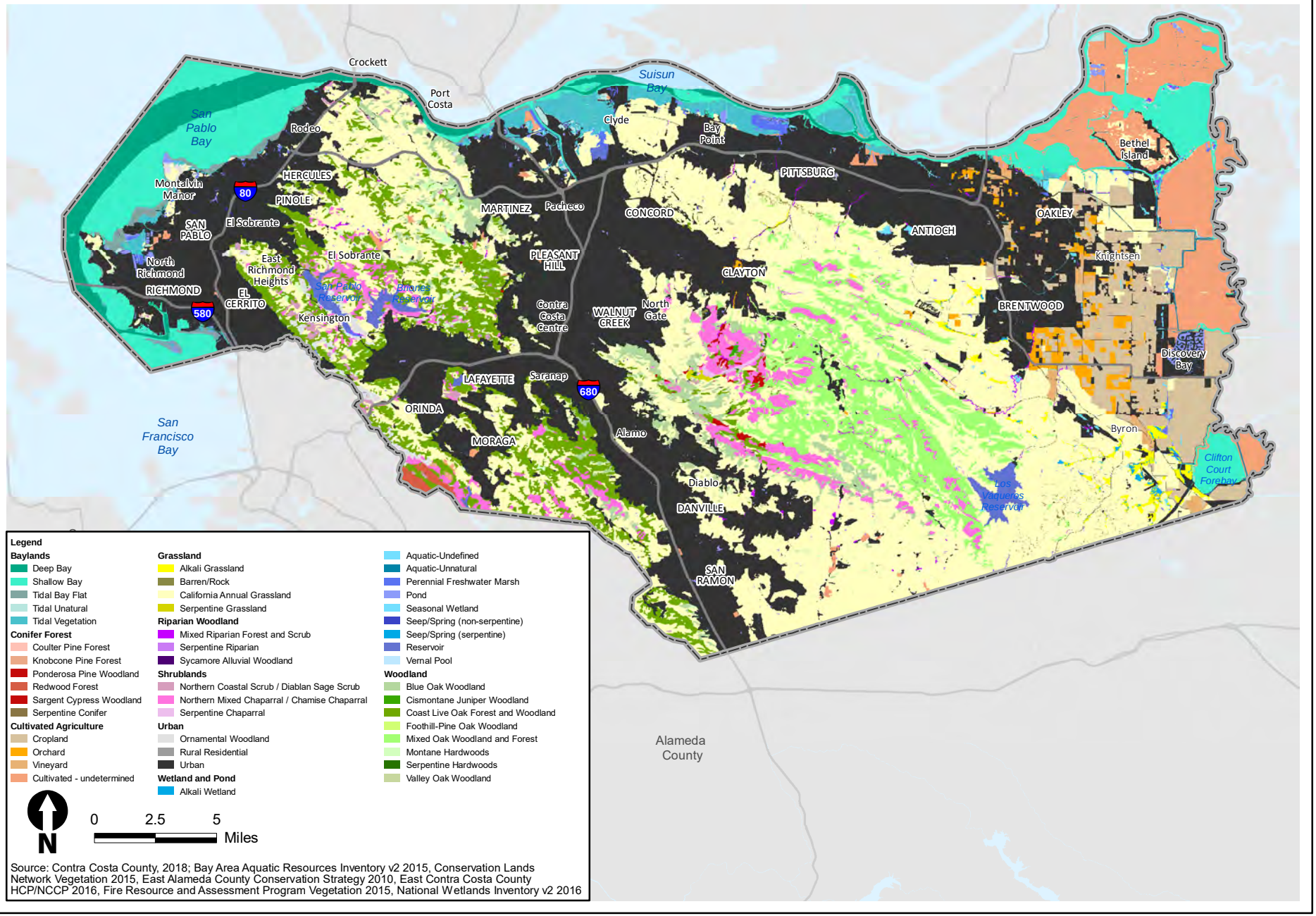

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Figure 2-7
Land Cover

Table 2-6. Extent of Natural Communities and Land Cover Types in Contra Costa County

Land Cover Type	Acres in the County	Percent of County
Grassland	**148,477**	**28.76%**
Alkali grassland*	2,164	0.42%
Barren/ rock	288	0.06%
California annual grassland	145,865	28.26%
Serpentine grassland*	160	0.03%
Shrublands	**14,661**	**2.84%**
Northern mixed chaparral/chamise chaparral*	12,112	2.35%
Northern coastal scrub/ Diablan sage scrub*	2,257	0.44%
Serpentine chaparral*	292	0.06%
Woodland	**61,464**	**11.91%**
Blue oak woodland	9,520	1.84%
Cismontane juniper woodland*	67	0.01%
Coast live oak forest and woodland	25,167	4.88%
Mixed-oak woodland and forest	24,781	4.80%
Montane hardwood*	1,595	0.31%
Serpentine hardwood*	78	0.02%
Valley oak woodland*	256	0.05%
Conifer Forest	**1,531**	**0.30%**
Coulter pine forest*	68	0.01%
Knobcone pine forest*	80	0.02%
Ponderosa pine woodland*	544	0.11%
Redwood forest*	818	0.16%
Serpentine conifer*	21	< 0.01%
Riparian Woodland	**811**	**0.16%**
Mixed riparian forest and scrub*	811	0.16%
Wetland and Pond	**9,492**	**1.84%**
Alkali wetland*	413	0.08%
Aquatic-undefined	435	0.08%
Aquatic-unnatural	590	0.11%
Perennial freshwater marsh*	1,705	0.33%
Pond*	2,257	0.44%
Spring/seep (non-serpentine)*	161	0.03%
Seasonal wetland*	267	0.05%
Reservoir	3,662	0.71%
Vernal pool*	2	< 0.01%
Baylands	**57,557**	**11.15%**
Deep bay	13,284	2.57%
Shallow bay	33,471	6.48%
Tidal bay flat*	2,190	0.42%
Tidal unnatural	1,121	0.22%
Tidal vegetation*	7,491	1.45%

Land Cover Type	Acres in the County	Percent of County
Cultivated Agriculture	**52,261**	**10.12%**
Cropland	20,348	3.94%
Orchard	3,821	0.74%
Vineyard	1,915	0.37%
Cultivated-undetermined	26,177	5.07%
Urban	**167,516**	**32.45%**
Ornamental woodland	2,329	0.45%
Rural residential	14	< 0.01%
Urban	165,174	32.00%
Unmapped	**2,418**	**0.47%**
Total	**516,187**	**100%**

* Identified as a rare land cover type.

Bay Area Aquatic Resources Inventory v2, 2015; Conservation Lands Network Vegetation, 2015; East Alameda County Conservation Strategy, 2010; East Contra Costa County HCP/NCCP, 2016; Fire Resource and Assessment Program Vegetation, 2015; National Wetlands Inventory v2, 2016.

Grassland

The grassland natural community consists of herbaceous vegetation dominated by grasses and forbs. Grasslands are found in upland topographic locations, generally irrespective of landscape position, slope, and aspect. Grassland provides many ecosystem services, such as carbon sequestration, nutrient cycling, and agricultural benefits (Jones and Donnelly 2004). Areas devoid of vegetation but located within grasslands are also included in this natural community as individual land cover types.

Shrublands

The shrublands natural community is composed of two distinct vegetation communities, chaparral and scrub land cover types. Chaparral occurs on rocky, porous, nutrient-deficient soils on steep slopes up to 2,000 meters in elevation (Keeley 2000). These communities are dominated by densely packed and nearly impenetrable drought-adapted evergreen woody shrubs with small, thick, leathery sclerophyllous leaves (Hanes 1988; Keeley 2000). In comparison, the scrub land cover types generally consist of low “soft” shrubs in open to dense shrublands, interspersed with grassy openings or little to no herbaceous layer. Shrublands provide many ecosystem services, such as carbon sequestration, nutrient cycling, forage for wildlife, and passive recreational open space values (Garnache et al. 2018).

Woodland

The woodland natural community is an upland vegetation community dominated by hardwood tree species and characterized by a prevalence of various species of oaks (*Quercus* spp.). The composition of this natural community can range from open savannas with grassy understories to dense woodlands with persistent leaf litter that precludes much herbaceous understory or shrubby understories. The canopy can vary from pure stands of oak trees to stands intermixed with other

broadleaf and coniferous trees. Woodlands provide many ecosystem services, such as carbon sequestration, nutrient cycling, erosion control, forage for wildlife, and passive open space values (U.S. Department of Agriculture 2018).

Conifer Forest

The conifer forest natural community is an upland vegetation community dominated by cone-bearing, needle-leaved or scale-leaved evergreen trees. The canopy can range from open to continuous with one or two tiers. Shrub layers are sparse to continuous, and herbaceous cover can be sparse to abundant. Landforms associated with conifer forest include slopes, ridges, headlands, maritime terraces, rocky ridges, and sand dunes. The conifer forest provides many ecosystem services, such as carbon sequestration, nutrient cycling, erosion control, forage for wildlife, and passive recreational open space values (U.S. Department of Agriculture 2018).

Riparian Woodland

The riparian woodland natural community is dominated by trees and an understory of shrubs and forbs associated with riverine water sources. From the foothills to the valley floor, riparian woodland land cover types thrive along streambanks and floodplains. Riparian woodlands provide many ecosystem services, such as improved water quality, erosion control, flood management, forage for wildlife, movement corridors for fish and wildlife, and passive open space values (U.S. Department of Agriculture 2018).

Wetland and Pond

The wetland and pond natural community includes open water and aquatic habitats that are subject to seasonal or perennial flooding or ponding and may have hydrophytic herbaceous vegetation. Wetlands and ponds generally differ in their surface-area-to-volume ratio, water-level fluctuations, and vegetation cover. Wetlands typically support emergent vegetation, while ponds do not. Wetlands and ponds provide ecosystem services, such as improved water quality, flood management, and forage for wildlife (Mitsch et al. 2015).

Baylands

The baylands natural community consists of tidally influenced wetland and open water habitats as well as diked areas that are no longer under tidal influence. Tidally influenced areas may be natural or muted because of constructed structures such as levees, tidal gates, or culverts (San Francisco Estuary Institute 2011). Baylands provide ecosystem services such as improved water quality, flood management, and forage, resting, and nesting habitat for wildlife (Mitsch et al. 2015). The baylands natural community is located primarily along the western and northern perimeter of the county.

Cultivated Agriculture

The cultivated agriculture natural community consists of cultivated row crops, vineyards, orchards, and other crops that require soil tillage. This land cover provides agricultural value as an ecosystem service to the region (U.S. Department of Agriculture 2018) and contributes to the local economy, tourism, food-shed, and culture. Depending on the crop, cultivated agriculture can provide foraging habitat for birds such as Swainson's hawk and tricolored blackbird. Cultivated agriculture is located primarily in the northeast portion of the county.

Urban

The urban natural community consists of areas where native vegetation has been replaced with residential, commercial, and industrial development; transportation infrastructure; other structures; paved and impermeable surfaces; or horticultural plantings, turf areas, and lawns.

Chapter 3
Conservation

This chapter describes biological resources of conservation concern. Specifically, this chapter discusses special-status plant and wildlife species as well as the sensitive natural communities within the county.

Special-Status Species

Bordered by the Pacific Ocean, including San Francisco Bay, and expanding eastward into the Sacramento and San Joaquin Valleys, the Bay Area is one of only six hot spots[5] with respect to species rarity in the United States (Myers et al. 2000). The varied topography of the county, from estuarine habitat and coastal salt marsh to freshwater marsh and upland areas of grassland, chaparral, and oak woodland, provides habitat for a multitude of different species. The Bay Area is the most densely populated area in California outside the Southern California metropolitan region. As such, many species occurring within the area are designated special-status species (e.g., species of concern) because of habitat loss, degradation, or fragmentation of habitats (California Department of Fish and Wildlife 2015).

Plants

The county contains 72 special-status plant species (California Department of Fish and Wildlife 2018a). These species are found across the diverse and, in some cases, specialized habitats in the county. Special-status plants are more abundant in the eastern portions of the county, which retains a rural lifestyle that is compatible with the habitat needs of many of the special-status plant species. Table 3-1 lists all of the special-status plant species in the county that have been documented in the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2018a). Figure 3-1 identifies the locations for the occurrences of the special-status plant species.

Table 3-1. Special-Status Plant Species in Contra Costa County

Scientific Name	Common Name	Federal	State	Global	CRPR
Amsinckia grandiflora	Large flowered fiddleneck	E	E	G1	1B.1
Amsinckia lunaris	Bent-flowered fiddleneck	–	–	G2?	1B.2
Anomobryum julaceum	Silver slender moss	–	–	G5?	4.2
Arctostaphylos auriculata	Mount Diablo manzanita	–	–	G2	1B.3
Arctostaphylos manzanita subsp. *laevigata*	Contra Costa manzanita	–	–	G5T2	1B.2
Arctostaphylos pallida	Pallid manzanita	T	E	G1	1B.1
Astragalus tener var. *tener*	Alkali milk-vetch	–	–	G2T2	1B.2
Atriplex cordulata	Heartscale	–	–	G3T2	1B.2
Atriplex depressa	Brittlescale	–	–	G2Q	1B.2

[5] Hot spots must have at least 1,500 endemic plant species and a 75% loss of native vegetation.

Scientific Name	Common Name	Federal	State	Global	CRPR
Blepharizonia plumosa	Big tarplant	–	–	G2	1B.1
California macrophylla	Round-leaved filaree	–	–	G2	–
Calochortus pulchellus	Mount Diablo fairy lantern	–	–	G2	1B.2
Calystegia purpurata ssp. *saxicola*	Coastal bluff morning-glory	–	–	G4T2T3	1B.2
Campanula exigua	Chaparral harebell	–	–	G2	1B.2
Carex comosa	Bristly sedge	–	–	G5	2B.1
Centromadia parryi subsp. *congdonii*	Congdon's tarplant	–	–	G3T2	1B.2
Chloropyron molle subsp. *molle*	Soft bird's-beak	E	R	G2T1	1B.2
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	–	–	G5T4	2B.1
Cirsium andrewsii	Franciscan thistle	–	–	G3	1B.2
Cordylanthus nidularis	Mount Diablo bird's-beak	–	R	G1	1B.1
Delphinium californicum subsp. *interius*	Hospital Canyon larkspur	–	–	G3T3	1B.2
Delphinium recurvatum	Recurved larkspur	–	–	G3	1B.2
Dirca occidentalis	Western leatherwood	–	–	G2	1B.2
Eriastrum ertterae	Lime Ridge eriastrum	–	–	G2	1B.1
Eriogonum nudum var. *psychicola*	Antioch Dunes buckwheat	–	–	G5T1	1B.1
Eriogonum truncatum	Mount Diablo buckwheat	–	–	G2	1B.1
Eryngium jepsonii	Jepson's coyote-thistle	–	–	G2	1B.2
Eryngium racemosum	Delta coyote-thistle	–	E	G1Q	1B.1
Eryngium spinosepalum	Spiny-sepaled button-celery	–	–	G2	1B.2
Erysimum capitatum var. *angustatum*	Contra Costa wallflower	E	E	G5T1	1B.1
Eschscholzia rhombipetala	Diamond-petaled California poppy	–	–	G1	1B.1
Extriplex joaquiniana	San Joaquin spearscale = San Joaquin saltbush	–	–	G2	1B.2
Fritillaria agrestis	Stinkbells	–	–	G3	4.2
Fritillaria liliacea	Fragrant fritillary	–	–	G2	1B.2
Gillia millefoliata	Dark-eyed gillia	–	–	G2	1B.2
Grimmia torenii	Toren's grimmia	–	–	G2	1B.3
Helianthella castanea	Diablo helianthella	–	–	G2	1B.2
Hesperolinon breweri	Brewer's western flax	–	–	G2	1B.2
Hibiscus lasiocarpos var. *occidentalis*	Woolly rose-mallow	–	–	G5T2	1B.2
Hoita strobilina	Loma Prieta hoita	–	–	G2	1B.1
Holocarpha macradenia	Santa Cruz tarplant	T	E	G1	1B.1
Isocoma arguta	Carquinez goldenbush	–	–	G1	1B.1
Juglans hindsii	Northern California black walnut	–	–	G1	1B.1

Scientific Name	Common Name	Federal	State	Global	CRPR
Lasthenia conjugens	Contra Costa goldfields	E	–	G1	1B.1
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	–	–	G5T2	1B.2
Lilaeopsis masonii	Mason's lilaeopsis	–	R	G2	1B.1
Limosella australis	Delta mudwort	–	–	G4G5	2B.1
Madia radiata	Showy madia	–	–	G2	1B.1
Malacothamnus hallii	Hall's bush mallow	–	–	G2	1B.2
Meconella oregana	Oregon meconella	–	–	G2G3	1B.1
Monolopia gracilens	Woodland woollythreads	–	–	G3	1B.2
Navarretia gowenii	Lime ridge navarretia	–	–	G1	1B.1
Navarretia nigelliformis subsp. *nigelliformis*	Adobe navarretia	–	–	G4T3	4.2
Navarretia nigelliformis subsp. *radians*	Shining navarretia	–	–	G4T2	1B.2
Oenothera deltoides subsp. *howellii*	Antioch Dunes evening primrose	E	E	G5T1	1B.1
Phacelia phacelioides	Mount Diablo phacelia	–	–	G2	1B.2
Polygonum marinense	Marin knotweed	–	–	G2Q	3.1
Potamogeton zosteriformis	Eel-grass pondweed	–	–	G5	2B.2
Puccinellia simplex	California alkali grass	–	–	G3	1B.2
Sanicula saxatilis	Rock sanicle	–	R	G2	1B.2
Scutellaria galericulata	Marsh skullcap	–	–	G5	2B.2
Senecio aphanactis	Chaparral ragwort	–	–	G3	2B.2
Sperguglaria macrotheca var. *longistyla*	Long-styled sand-spurrey	–	–	G5T2	1B.2
Streptanthus albidus subsp. peramoenus	Most beautiful jewelflower	–	–	G2T2	1B.2
Streptanthus hispidus	Mount Diablo jewelflower	–	–	G2	1B.3
Stuckenia filiformis ssp. *alpina*	Slender-leaved pondweed	–	–	G5T5	2B.2
Suaeda californica	California seablight	E	–	G1	1B.1
Symphyotrichum lentum	Suisun Marsh aster	–	–	G2	1B.2
Trifolium hydrophilum	Saline clover	–	–	G2	1B.2
Triquetrella californica	Coastal triquetrella	–	–	G2	1B.2
Tropidocarpum capparideum	Caper-fruited tropidocarpum	–	–	G1	1B.1
Viburnum ellipticum	Oval-leaved viburnum	–	–	G4G5	2B.3

KEY

Federal: California Department of Fish and Wildlife. 2018c. *Special Animals List.* Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406.

E = Listed as endangered under the federal Endangered Species Act.

T = Listed as threatened under the federal Endangered Species Act.

– = No listing.

State: California Department of Fish and Wildlife. 2018c. *Special Animals List.* Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406.

E = Listed as endangered under the California Endangered Species Act.

T = Listed as threatened under the California Endangered Species Act.

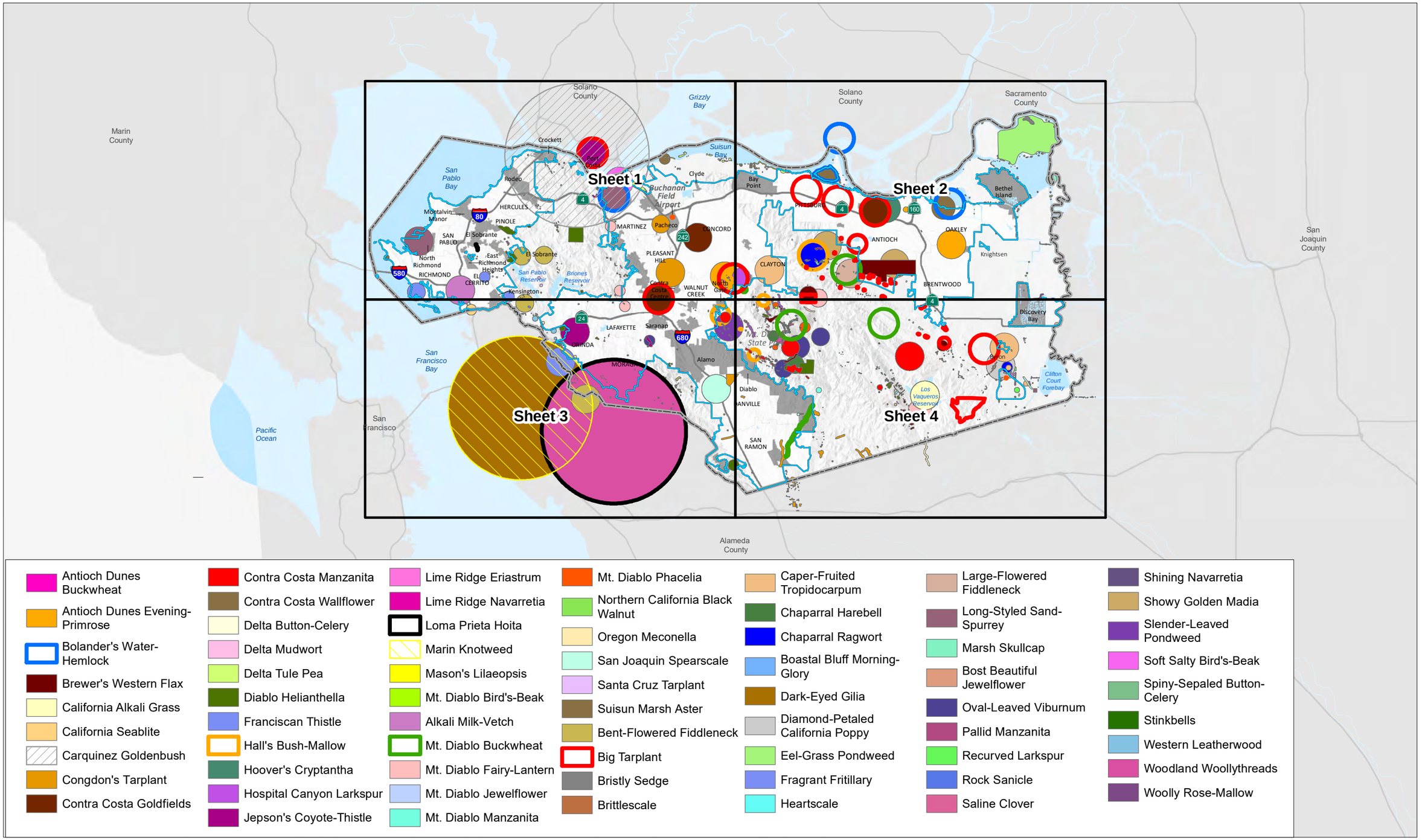
Scientific Name	Common Name	Federal	State	Global	CRPR

R = Listed as rare under the California Endangered Species Act
– = No listing.
Global: NatureServe. 2018. *Global Conservation Status Definitions*. Available: http://explorer.natureserve.org/granks.htm.
G1 = Critically imperiled; at very high risk for extinction.
G2 = Imperiled; at high risk for extinction.
G3 = Vulnerable; at moderate risk for extinction.
G4 = Apparently secure; uncommon but not rare.
G5 = Secure; common, widespread, and abundant.
G#G# = Range rank; numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community.
T# = Infraspecific taxon; status of infraspecific taxa (subspecies or varieties) indicated by a "T-rank" following the species' global rank.
? = inexact numeric rank
Q = Questionable taxonomy; taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid.
Rules for assigning T-ranks follow the same principles outlined above for global conservation status ranks. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.
California Rare Plant Rank (CRPR): California Native Plant Society. 2018. *Rare Plants*. Available: http://www.cnps.org/cnps/rareplants/ranking.php.
1B = Plants rare, threatened, or endangered in California and elsewhere.
0.1 = Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)
0.2 = Moderately threatened in California (20%–80% of occurrences threatened/moderate degree of immediacy of threat)

Wildlife

The county has a rich landscape that is home to a number of rare wildlife and fish species, including an endemic butterfly, the Lange's metalmark butterfly (*Apodemia mormo langei*), found only at the Antioch Dunes National Wildlife Refuge. A total of 84 special-status wildlife species are known to occur in the county, including the San Joaquin kit fox (*Vulpes macrotus mutica*), California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), western burrowing owl (*Athene cunicularia hypugea*), and vernal pool fairy shrimp (*Brachinecta lynchi*) (California Department of Fish and Wildlife 2018a). Often, these special-status wildlife species occur in protected areas, such as Mount Diablo State Park or Los Vaqueros Reservoir, or in various East Bay regional parks.

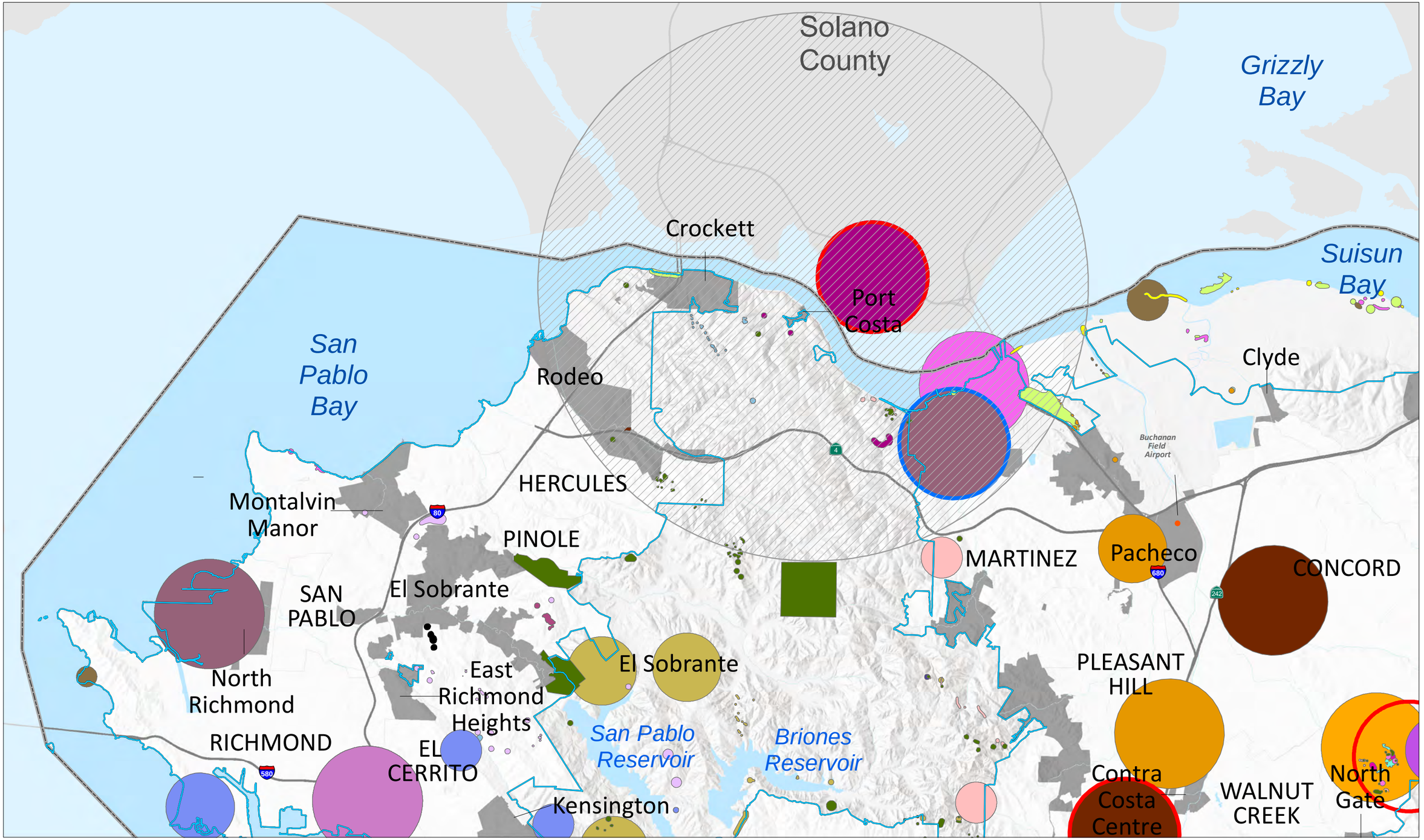
Similar to its benefits for special-status plant species, the rural grassland of the eastern portion of the county provides some of the best remaining undeveloped habitat for special-status wildlife species. For example, vernal pools, which provide essential habitat for special-status wildlife species such as California tiger salamander and fairy shrimp, are restricted to the Livermore Vernal Pool Region, which overlaps the eastern portion of the county. The Livermore Vernal Pool Region contains the Altamont Hills Core Area, with specific sites that are necessary for recovering endangered or threatened species or conserving species of concern. The Altamont Hills Core Area contains five distinct core area polygons near the Contra Costa County-Alameda County boundary (two in Alameda County and three in Contra Costa County), with the largest core area in the Bryon Hills/Vasco Caves region of Contra Costa County. Figures 3-2, 3-3, and 3-4 identify the locations for occurrences of special-status wildlife, insect, and fish species, respectively. Table 3-2 lists all of the special-status wildlife, insect, and fish species in the county that have been documented in the CNDDB (California Department of Fish and Wildlife 2018a).



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: The following sheets provide a detailed map of each quadrant of the County.

Figure 3-1
Overview Map
Special-Status Plant Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

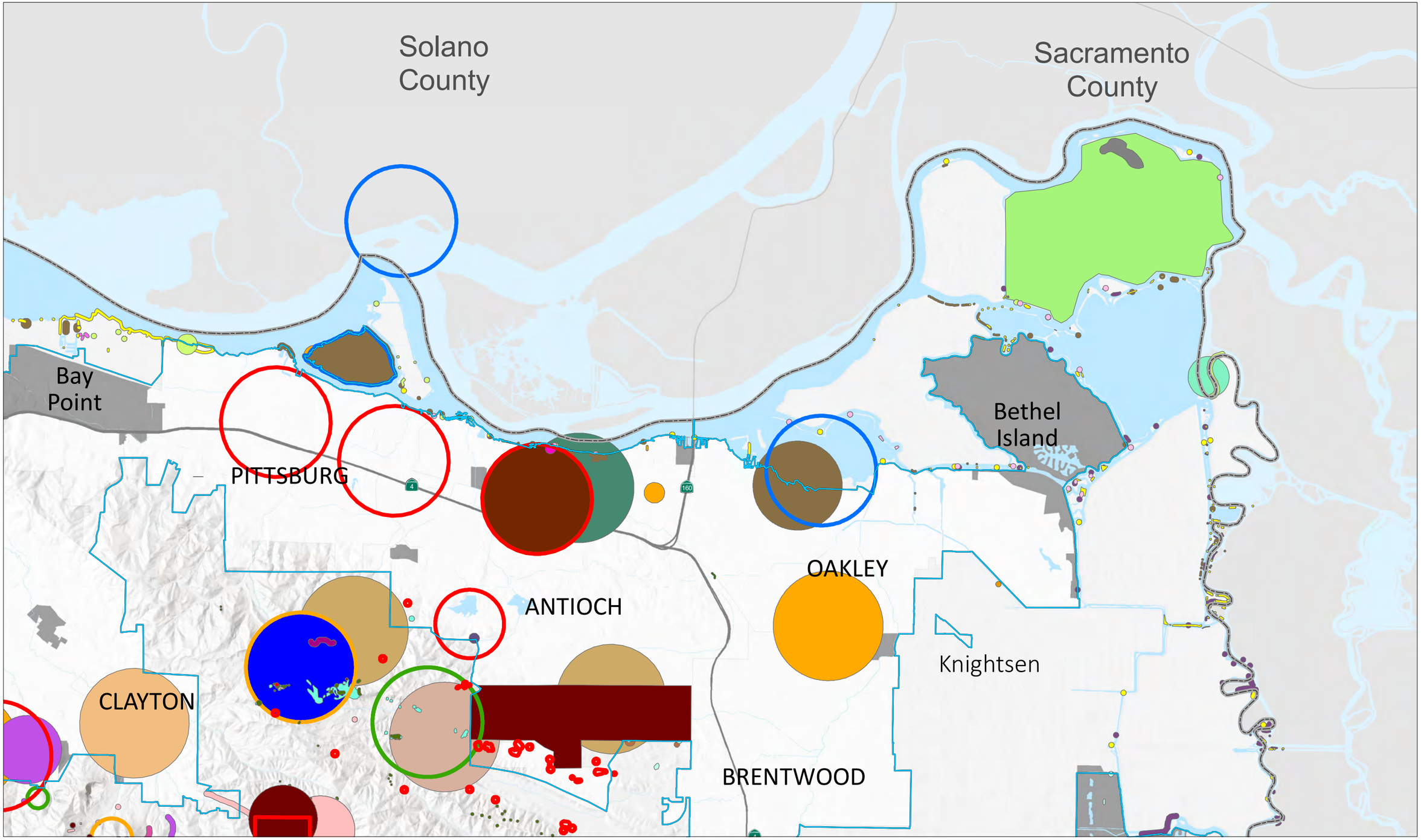
0 0.75 1.5 3 Miles

N

1 2 3 4

Note: See legend on Overview Map

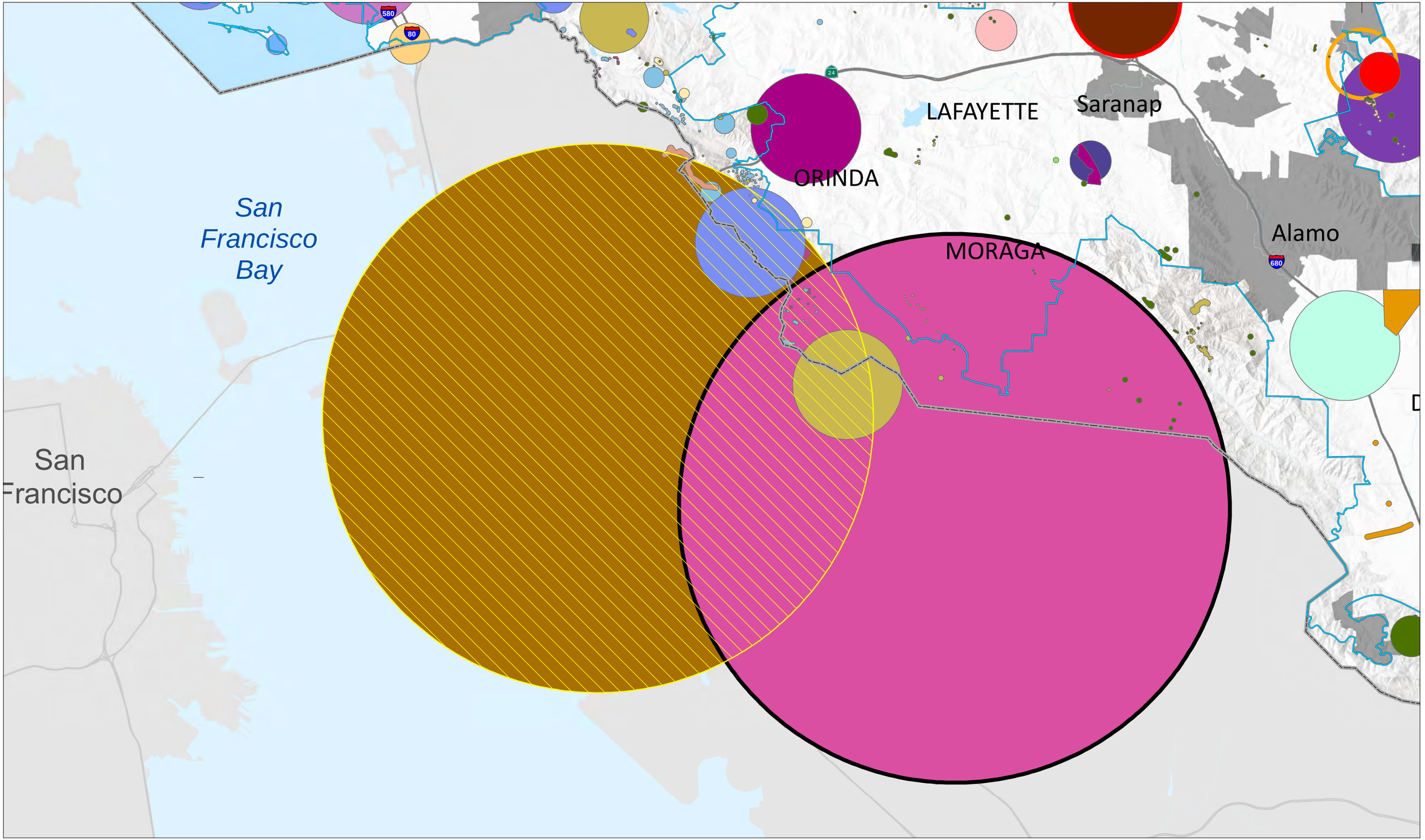
Figure 3-1
Sheet 1
Special-Status Plant Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See legend on Overview Map

Figure 3-1
Sheet 2
Special-Status Plant Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

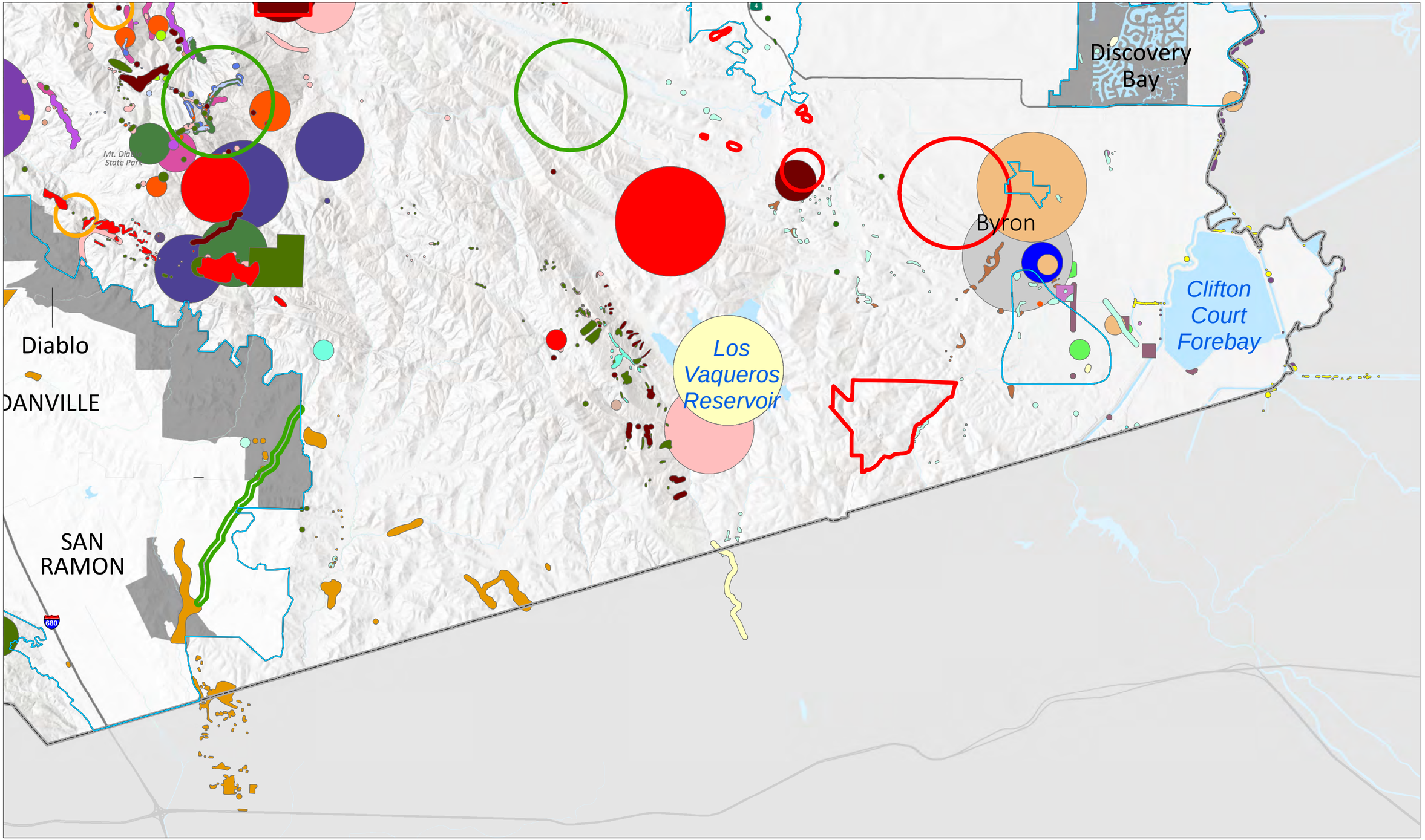
0 0.75 1.5 3 Miles

N

1 2 3 4

Note: See legend on Overview Map

Figure 3-1
Sheet 3
Special-Status Plant Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

0 0.75 1.5 3 Miles

N

Note: See legend on Overview Map

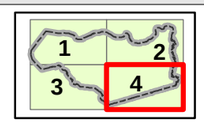
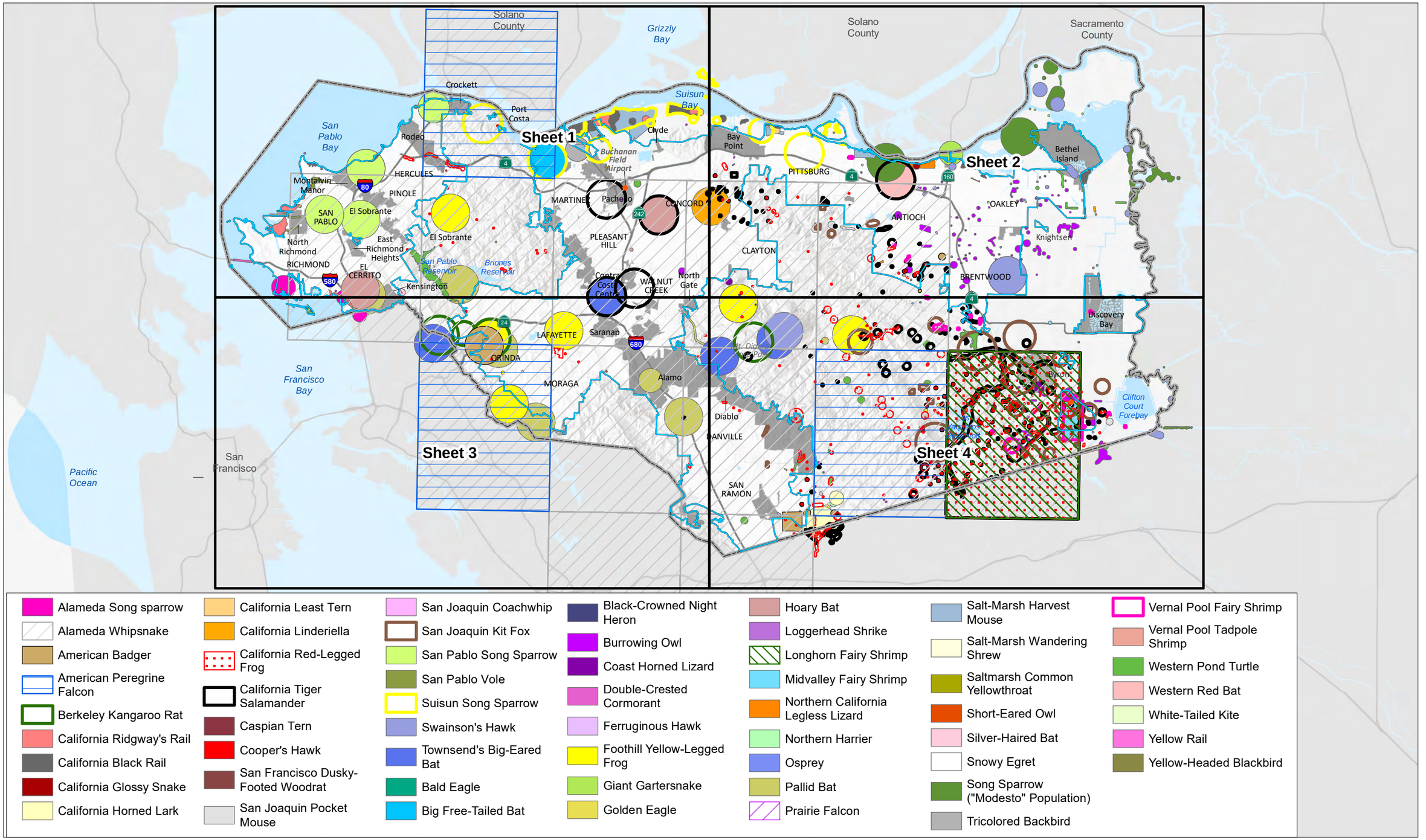


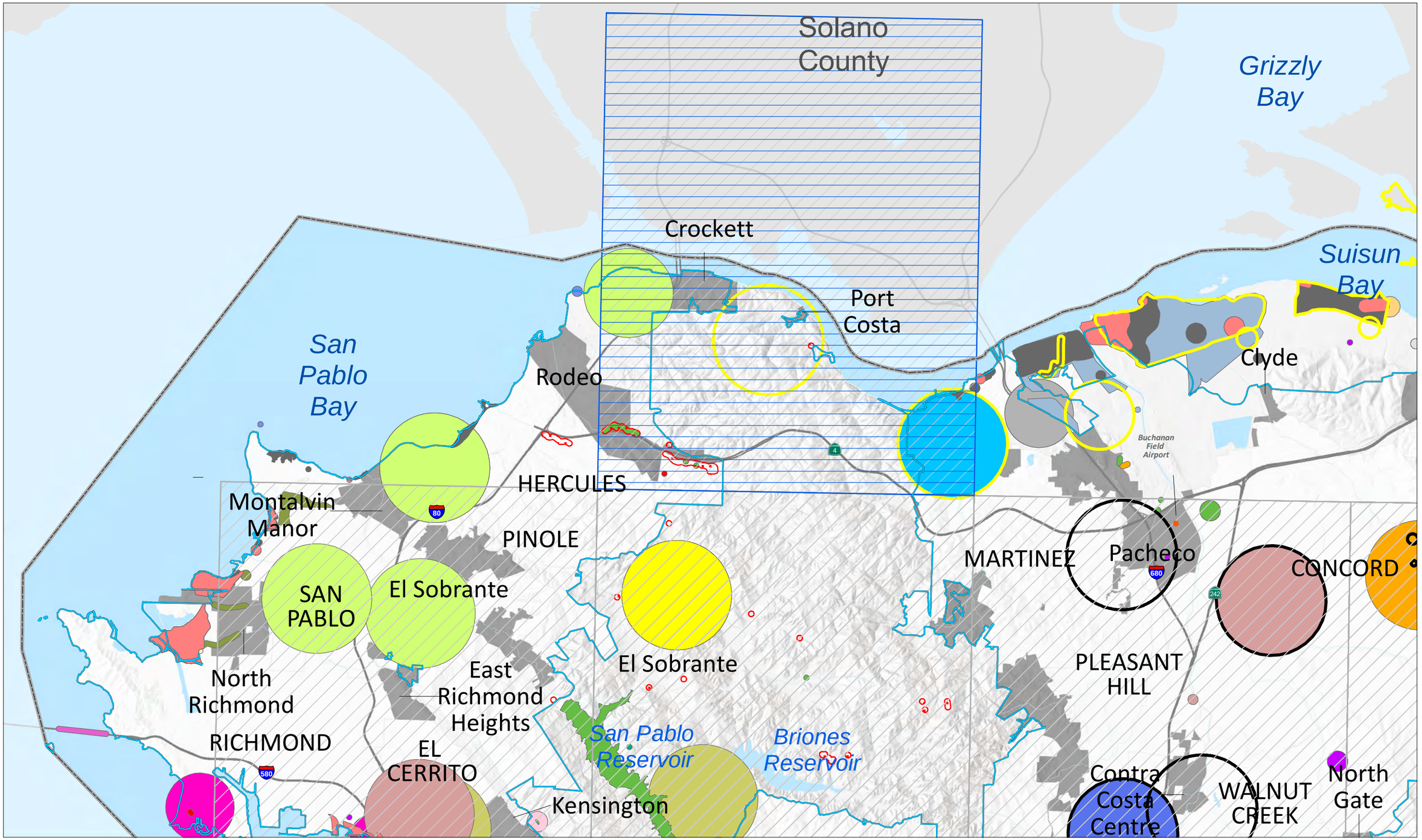
Figure 3-1
Sheet 4
Special-Status Plant Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: The following sheets provide a detailed map of each quadrant of the County.

Figure 3-2
Overview Map
Special-Status Wildlife Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

ICF

Note: See legend on Overview Map

Figure 3-2
Sheet 1
Special-Status Wildlife Species Occurrences

Solano County

Sacramento County

Bay Point

PITTSBURG

Bethel Island

OAKLEY

ANTIOCH

Knightsen

CLAYTON

BRENTWOOD

Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

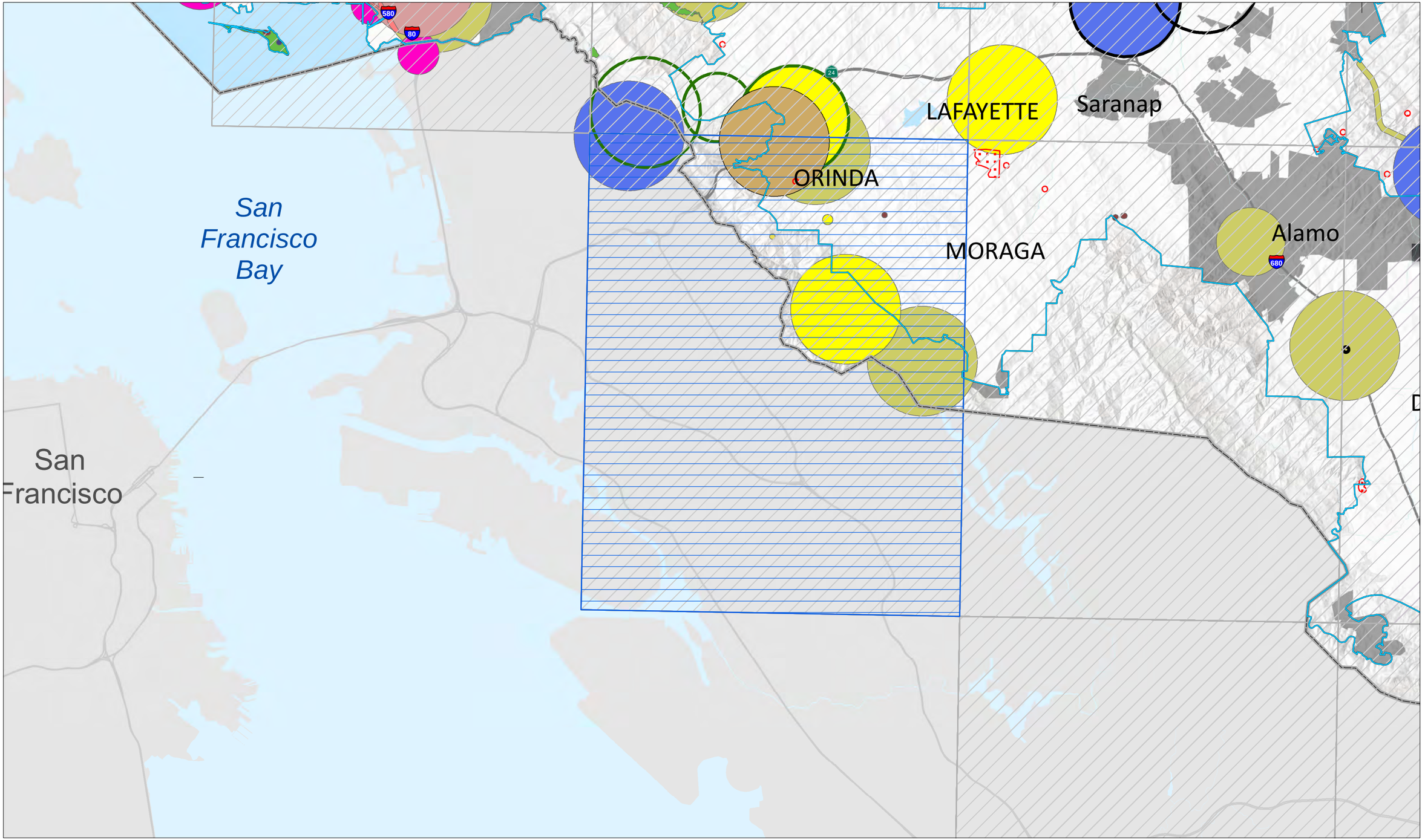
0 0.5 1 2
Miles

N

1 2 3 4

Note: See legend on Overview Map

Figure 3-2
Sheet 2
Special-Status Wildlife Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

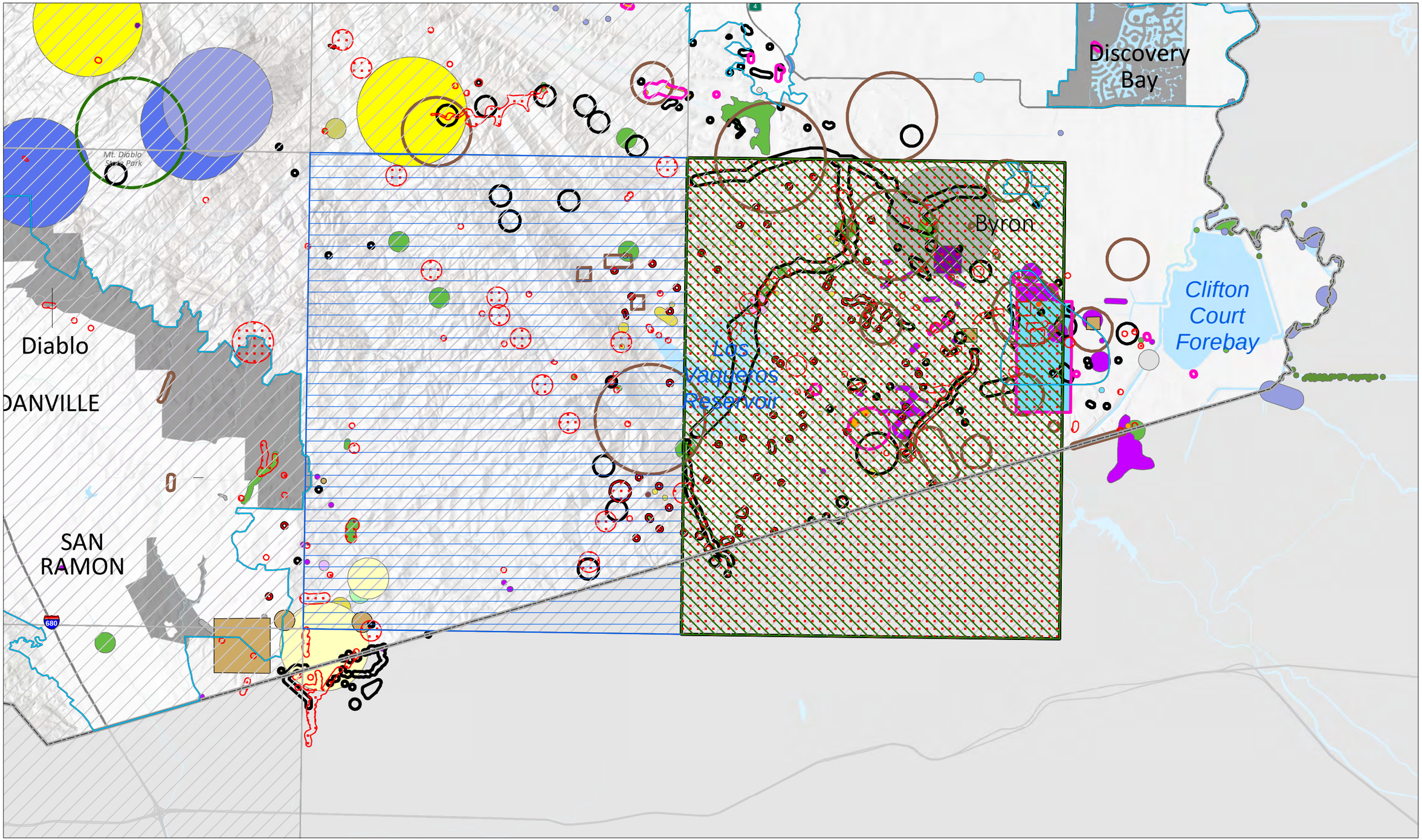
0 0.5 1 2
Miles

N

1 2 3 4

Note: See legend on Overview Map

Figure 3-2
Sheet 3
Special-Status Wildlife Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

0 0.5 1 2
Miles

N

Note: See legend on Overview Map

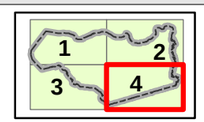
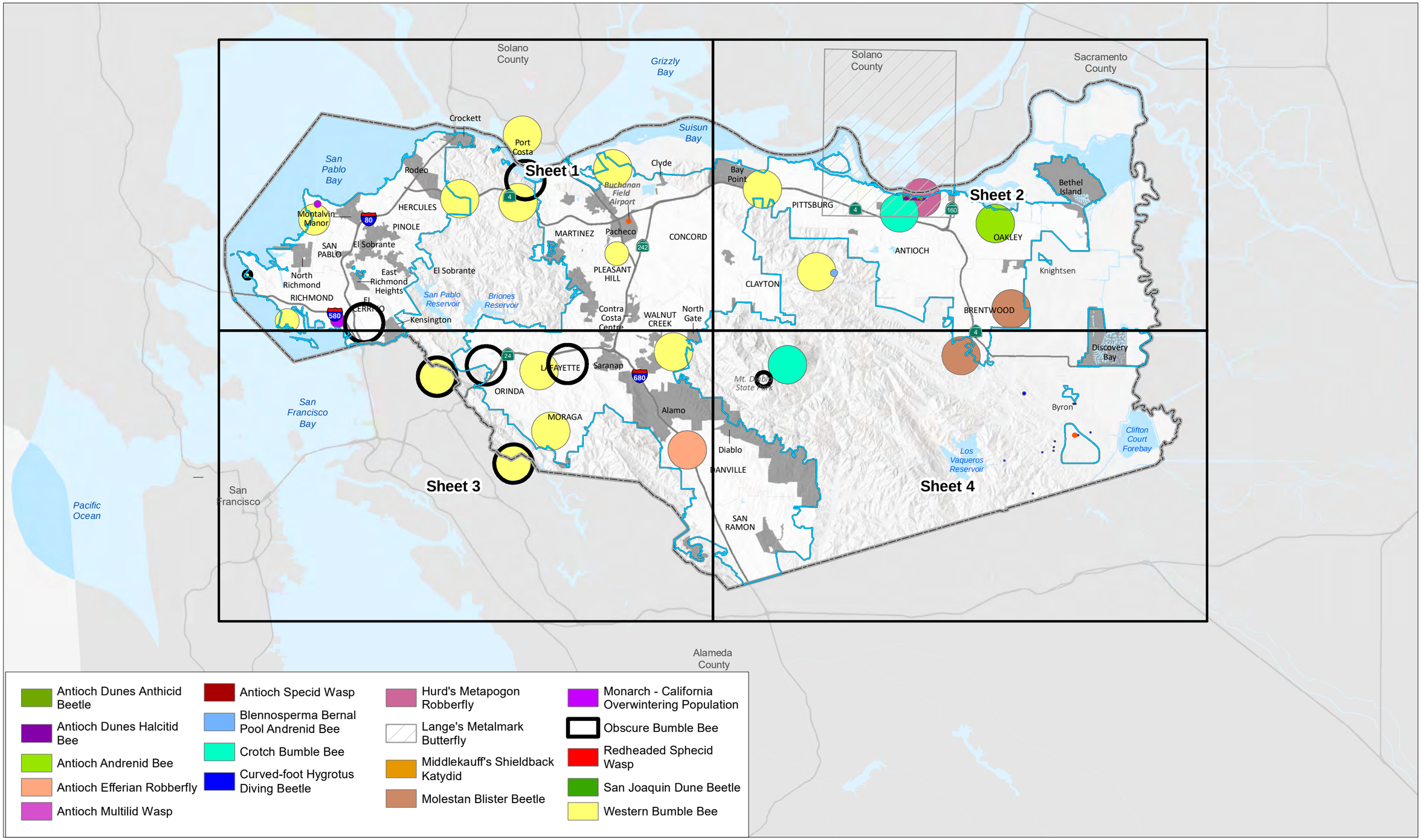


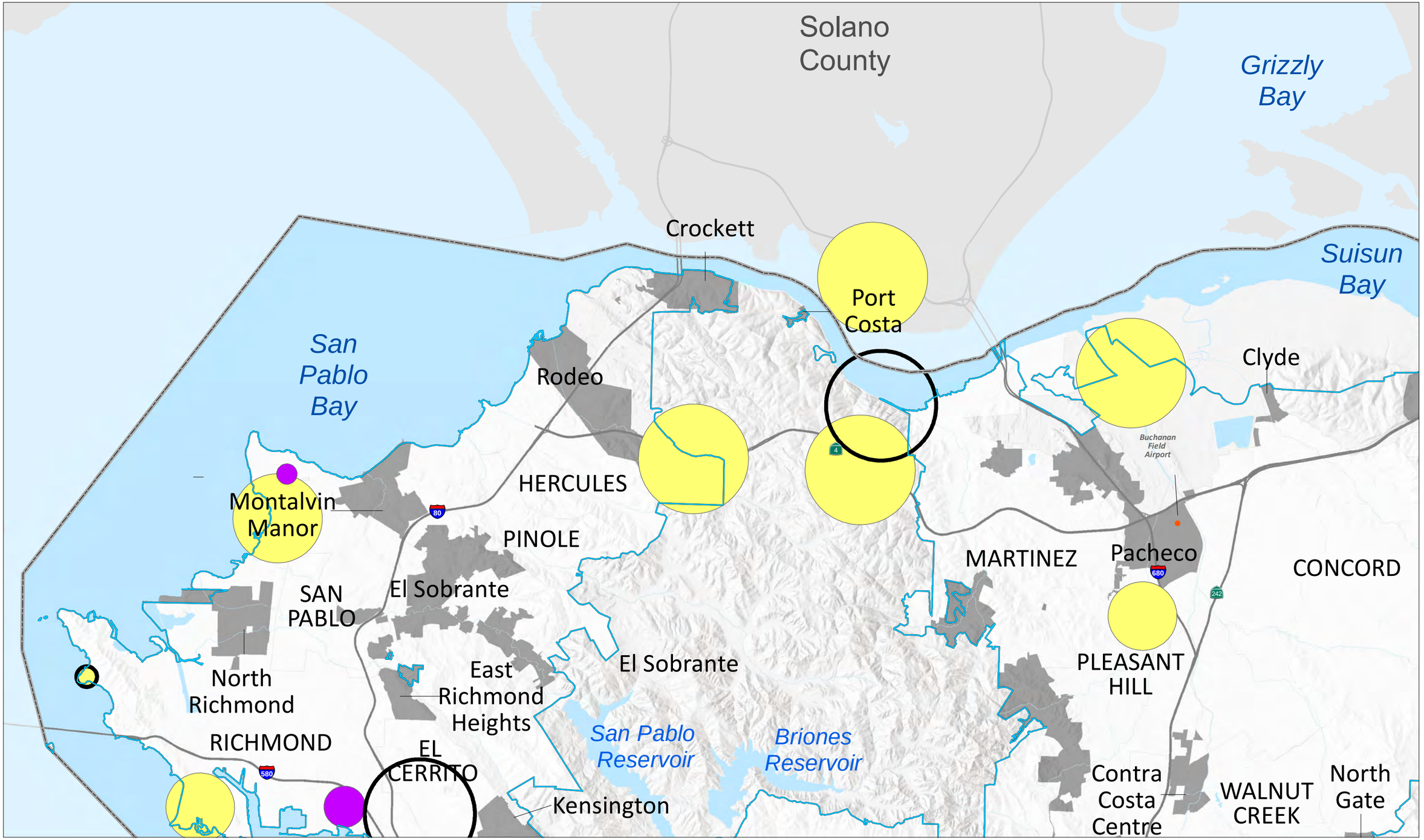
Figure 3-2
Sheet 4
Special-Status Wildlife Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: The following sheets provide a detailed map of each quadrant of the County.

Figure 3-3
Overview Map
Special-Status Insect Species



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

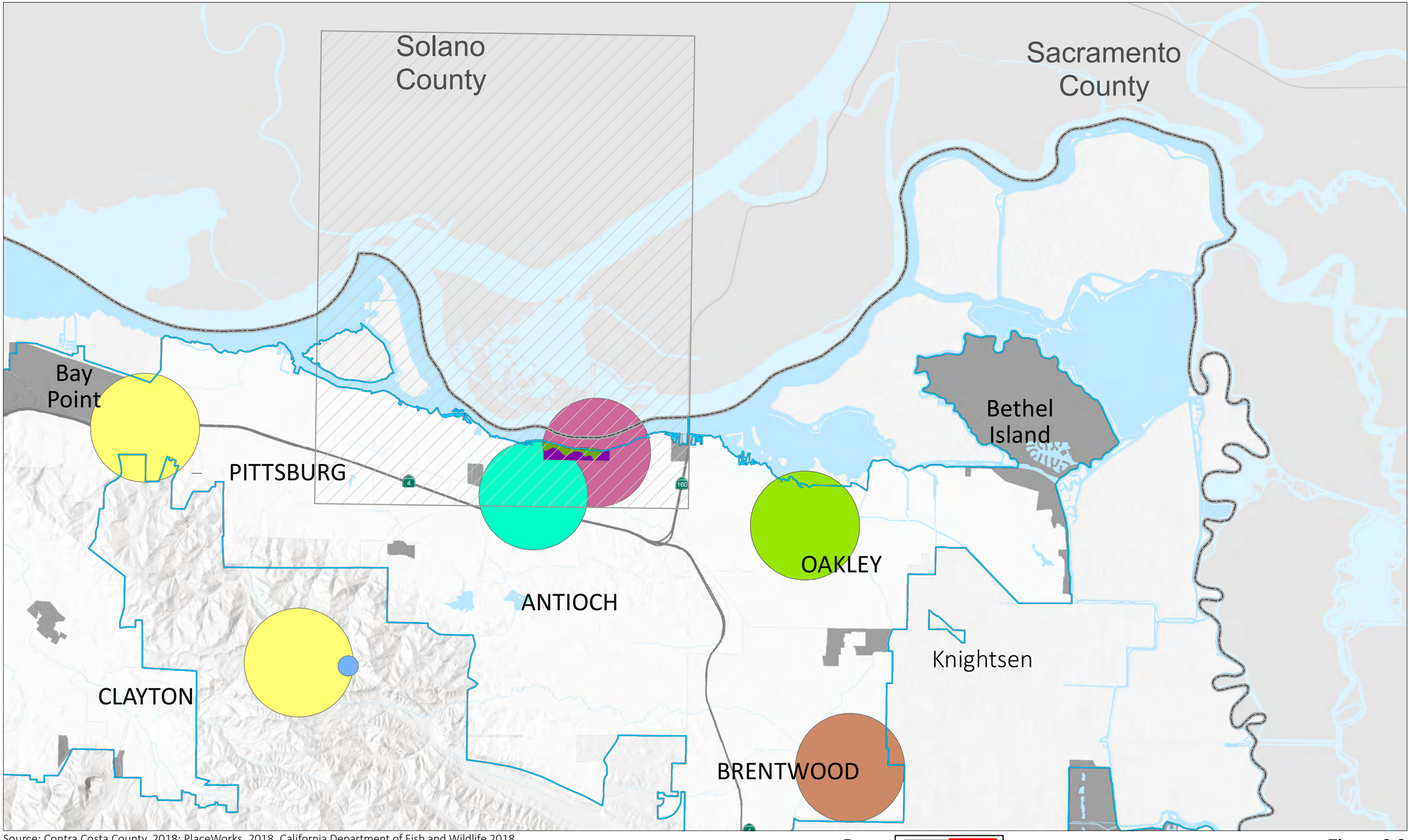
0 0.75 1.5 3 Miles

N

1 2 3 4

Note: See legend on Overview Map

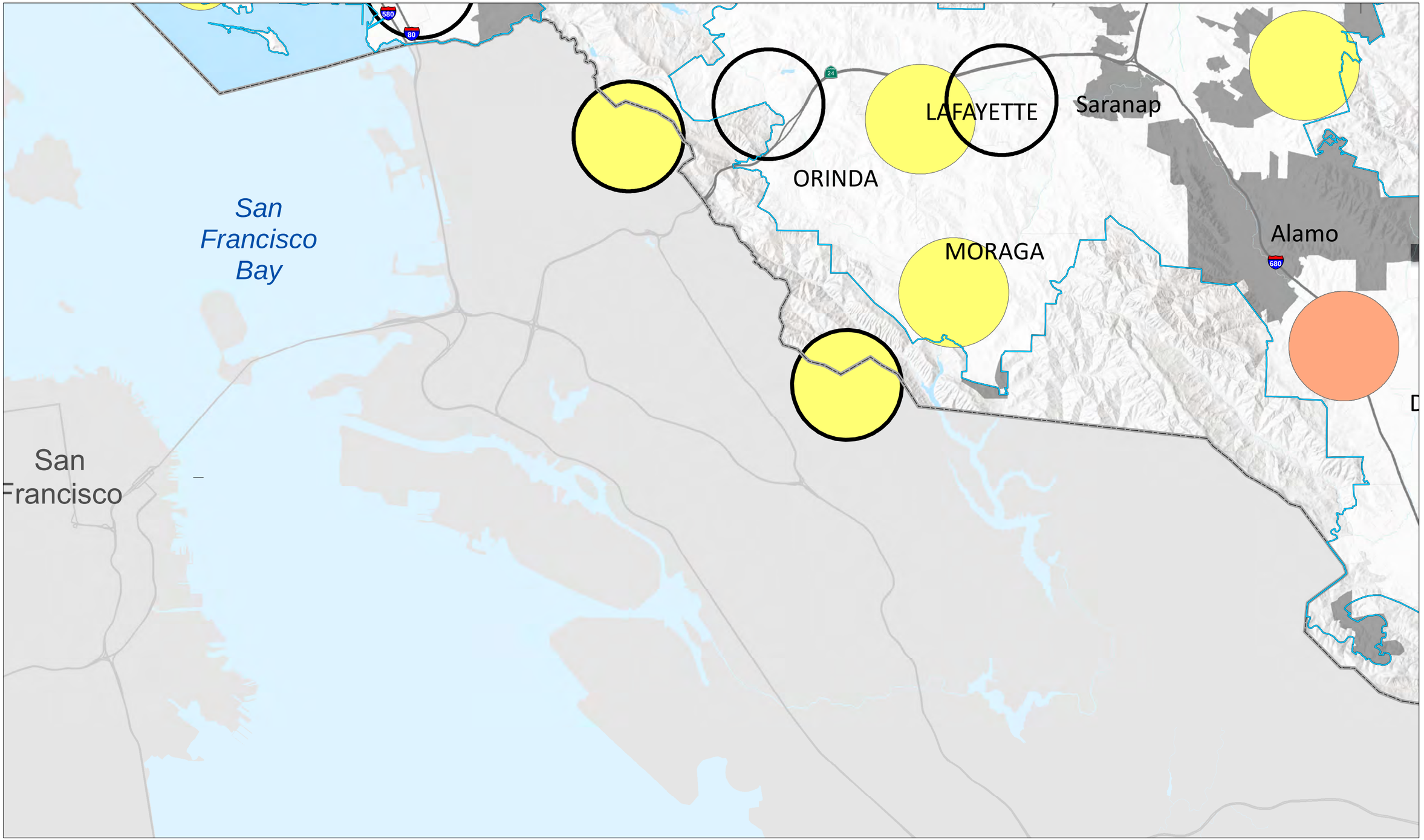
Figure 3-3
Sheet 1
Special-Status Insect Species



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See legend on Overview Map

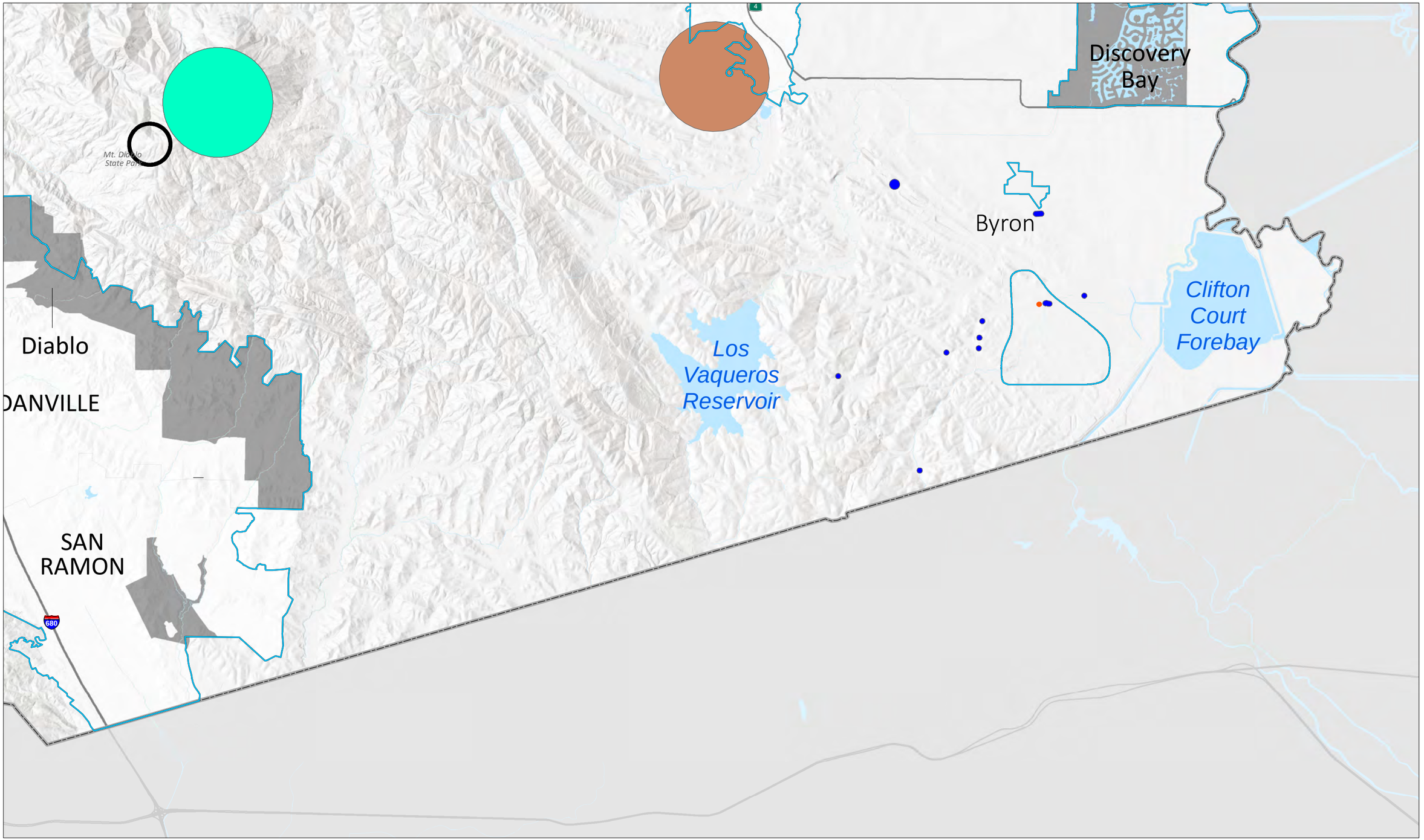
Figure 3-3
Sheet 2
Special-Status Insect Species



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See legend on Overview Map

Figure 3-3
Sheet 3
Special-Status Insect Species



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

0 0.75 1.5 3 Miles

N

Note: See legend on Overview Map

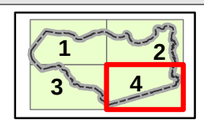
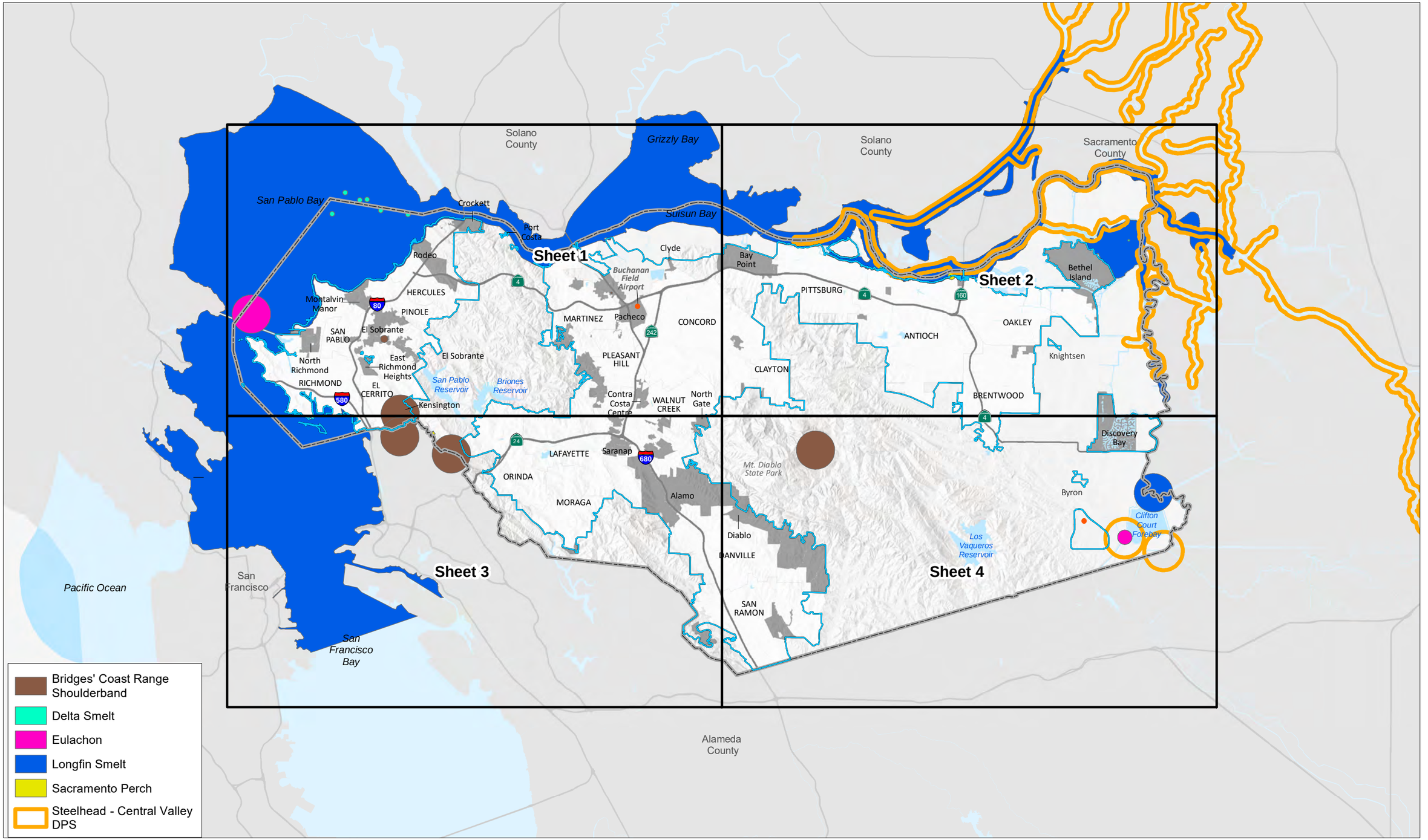


Figure 3-3
Sheet 4
Special-Status Insect Species



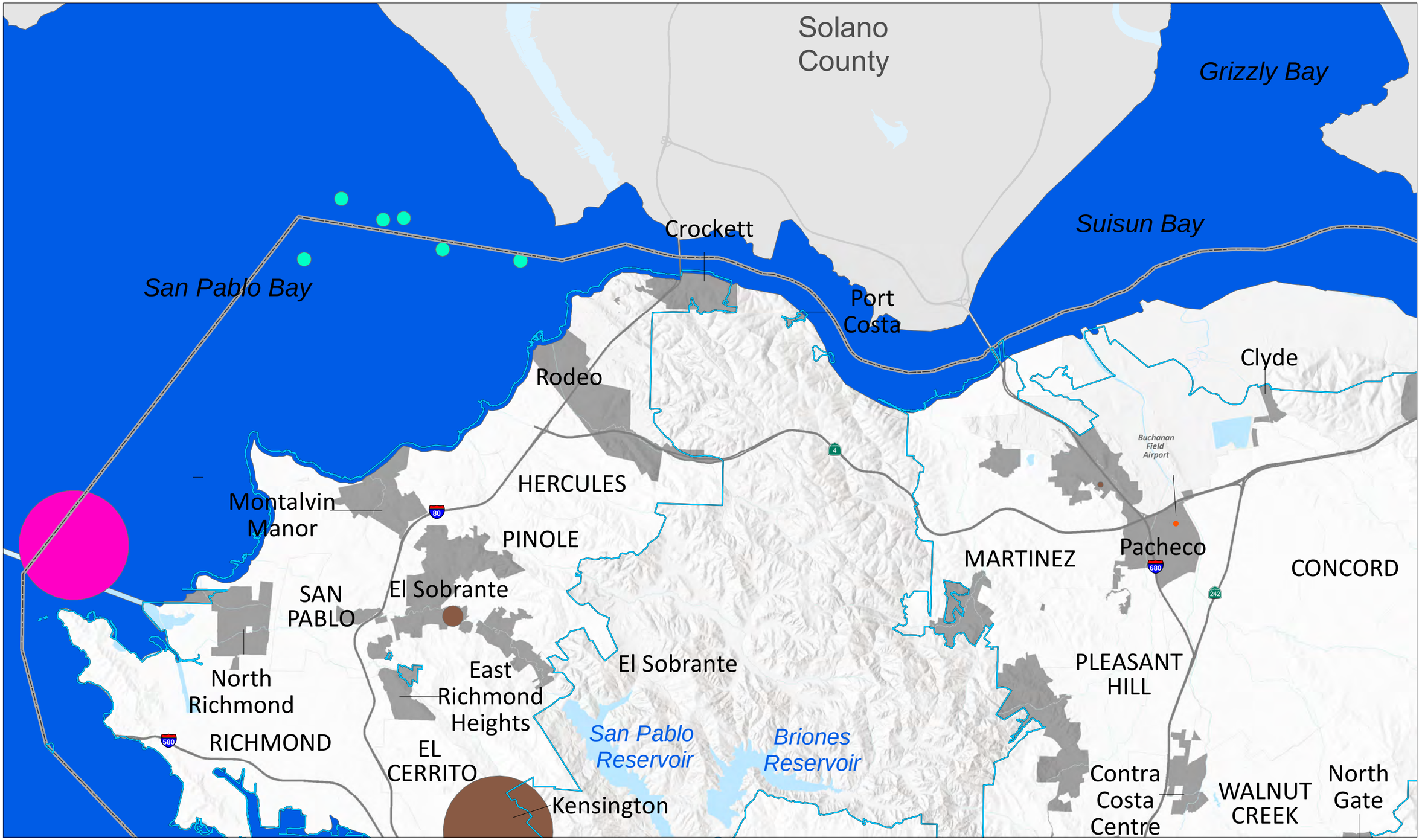
Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

0 2 4 8 Miles

N

Note: The following sheets provide a detailed map of each quadrant of the County.

Figure 3-4
Overview Map
Special-Status Fish and Mollusk Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See legend on Overview Map

Figure 3-4
Sheet 1
Special-Status Fish and Mollusk Species Occurrences

Solano County

Sacramento County

Honker Bay

Suisun Bay

Bay Point

PITTSBURG

Bethel Island

ANTIOCH

OAKLEY

Knightsen

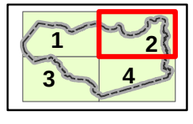
CLAYTON

BRENTWOOD

Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

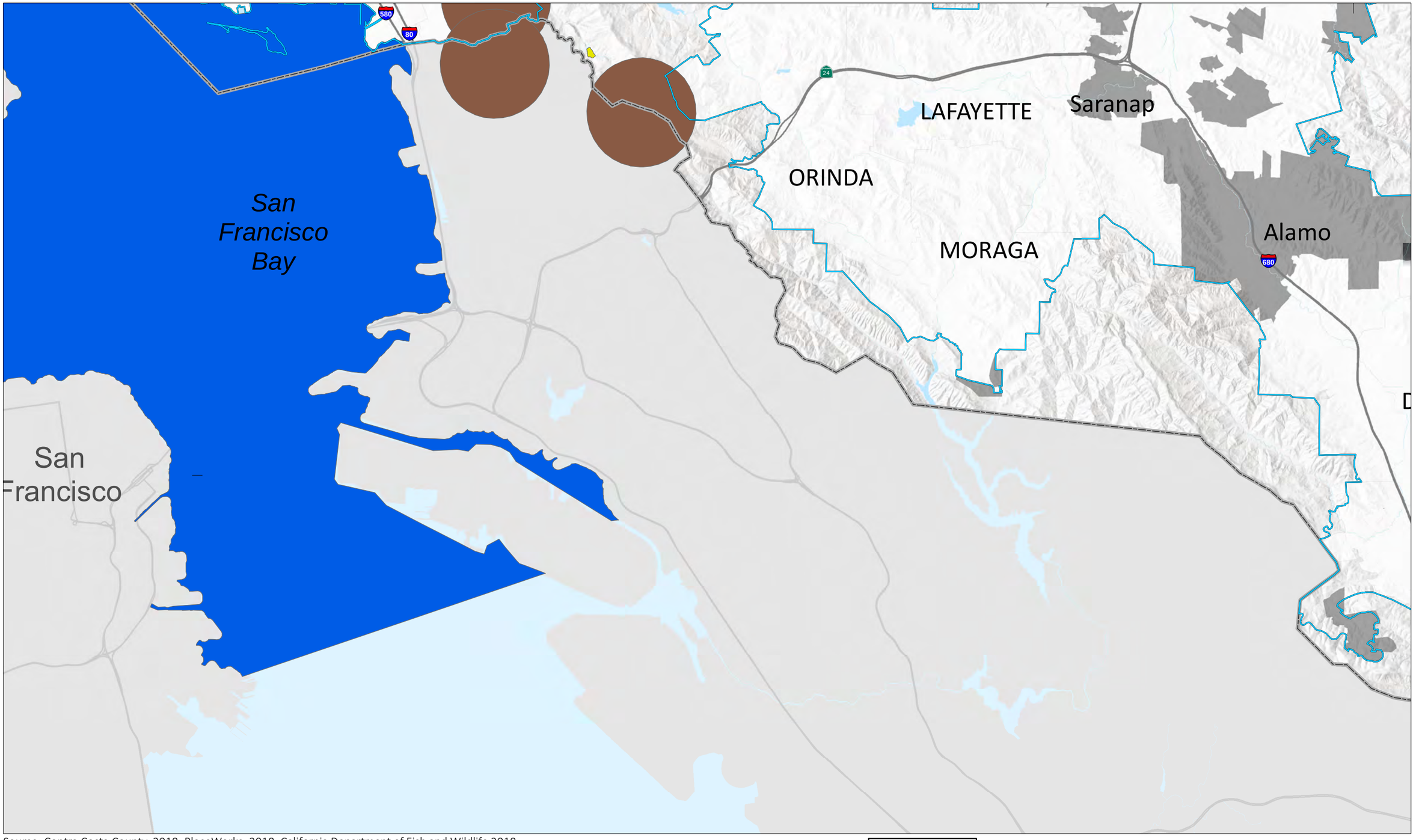
0 0.75 1.5 3
Miles

N



Note: See legend on Overview Map

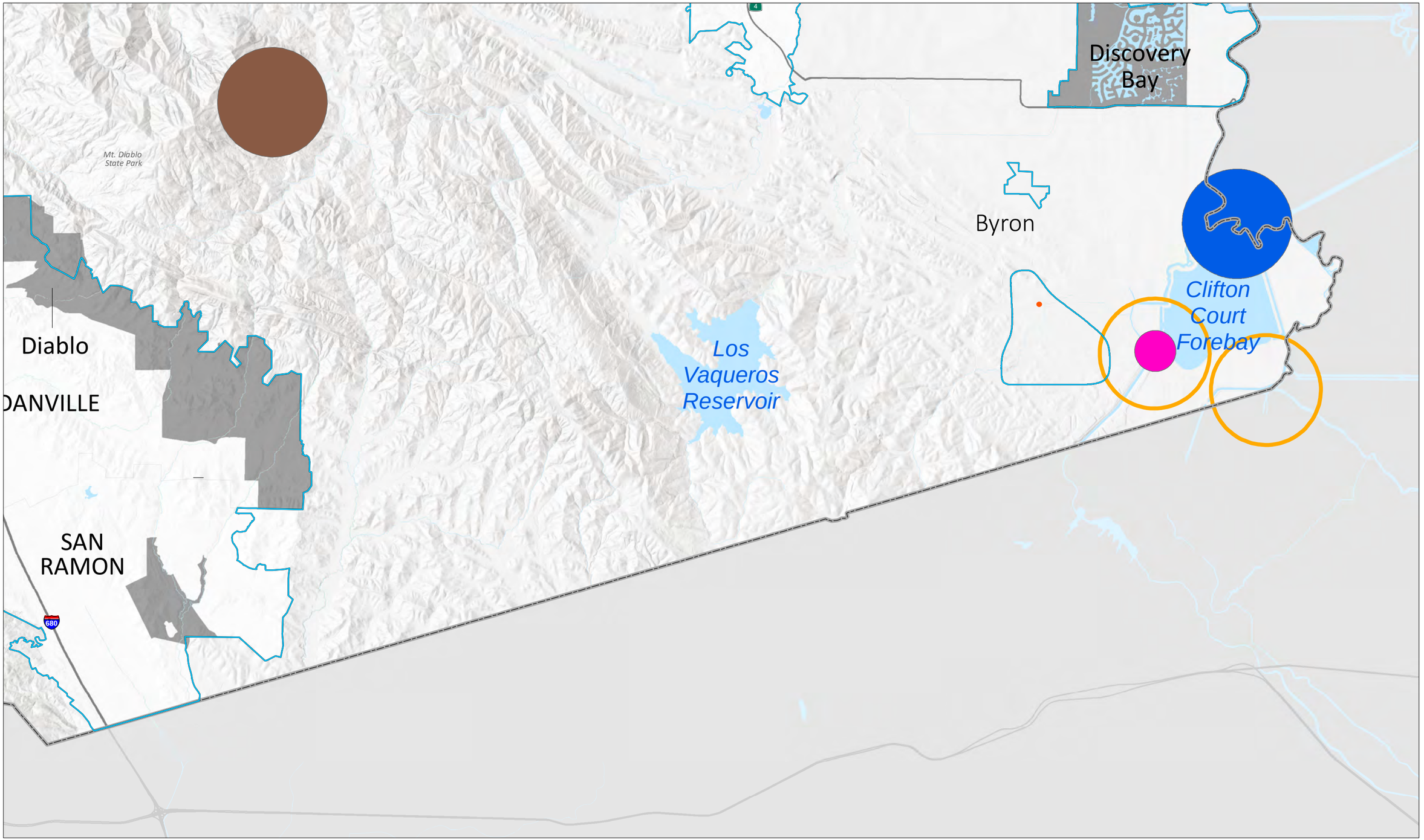
Figure 3-4
Sheet 2
Special-Status Fish and Mollusk Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See legend on Overview Map

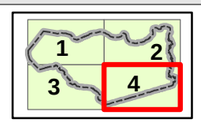
Figure 3-4
Sheet 3
Special-Status Fish and Mollusk Species Occurrences



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

0 0.75 1.5 3
Miles

N



Note: See legend on Overview Map

Figure 3-4
Sheet 4
Special-Status Fish and Mollusk Species Occurrences

Table 3-2. Special-Status Wildlife, Insect, and Fish Species in Contra Costa County

Scientific Name	Common Name	Federal	State	Global
Andrena blenospermatis	Blennosperma vernal pool andrenid bee	–	–	G2
Anthicus antiochensis	Antioch Dunes anthicid beetle	–	–	G2
Apodemia mormo langei	Lange's metalmark butterfly	E	–	G5T1
Bombus caliginosus	Obscure bumble bee	–	–	G4?
Bombus crotchii	Crotch bumble bee	–	–	G3G4
Bombus occidentalis	Western bumble bee	*	–	G2G3
Branchinecta longiantenna	Longhorn fairy shrimp	E	–	G1
Branchinecta lynchi	Vernal pool fairy shrimp	T	–	G3
Branchinecta mesovallensis	Midvalley fairy shrimp	–	–	G2
Coelus gracilis	San Joaquin dune beetle	–	–	G1
Danaus plexippus	Monarch butterfly (overwintering population)	*	–	G4T2T3
Efferia antiochi	Antioch efferian robberfly	–	–	G1G2
Eucerceris ruficeps	Redheaded sphecid wasp	–	–	G1G3
Helminthoglypta nickliniana bridgesi	Bridges' coast range shoulderband	–	–	G3T1
Hygrotus curvipes	Curved-foot hygrotus diving beetle	–	–	G1
Idiostatus middlekauffi	Middlekauff's shieldback katydid	–	–	G1G2
Lepidurus packardi	Vernal pool tadpole shrimp	E	–	G4
Linderiella occidentalis	California fairy shrimp	–	–	G2G3
Lytta molesta	Molestan blister beetle	–	–	G2
Metapogon hurdi	Hurd's metapogon robberfly	–	–	G1G2
Myrmosula pacifica	Antioch multilid wasp	–	–	GH
Perdita scitula antiochensis	Antioch andrenid bee	–	–	G1T1
Philanthus nasalis	Antioch specid wasp	–	–	G1
Sphecodogastra antiochensis	Antioch Dunes halcitid bee	–	–	G1
Archoplites interruptus	Sacramento perch	–	SSC	G2G3
Hypomesus transpacificus	Delta smelt	T	T	G1
Oncorhynchus mykiss	Central Valley DPS steelhead	T	–	G5T2Q
Spirinchus thaleichthys	Longfin smelt	C	T, SSC	G5
Thaleichthys pacificus	Eulachon	T	–	G5
Ambystoma californiense	California tiger salamander (Central CA DPS)	T	T	G2G3
Rana boylii	Foothill yellow-legged frog	*	C, SSC	G3
Rana draytonii	California red-legged frog	T	SSC	G2G3
Anniella pulchra	Northern California legless lizard	–	SSC	G3
Arizona elegans occidentalis	California glossy snake	–	SSC	G5T2
Emys marmorata	Western pond turtle	*	SSC	G3G4

Scientific Name	Common Name	Federal	State	Global
Masticophis flagellum ruddocki	San Joaquin coachwhip (= whipsnake)	–	SSC	G5T2T3
Masticophis lateralis euryxanthus	Alameda whipsnake	T	T	G4T2
Phrynosoma blainvillii	Coast horned lizard	–	SSC	G3G4
Thamnophis gigas	Giant garter snake	T	T	G2
Accipiter cooperii	Cooper's hawk	–	–	G5
Accipiter striatus	Sharp-shinned hawk	–	SSC	G5
Agelaius tricolor	Tricolored blackbird	*	Candidate, SSC	G2G3
Aquila chrysaetos	Golden eagle	–	FP, SSC	G5
Asio flammeus	Short-eared owl	–	SSC	G5
Athene cunicularia	Burrowing owl	–	SSC	G4
Buteo regalis	Ferruginous hawk	–	SSC	G4
Buteo swainsoni	Swainson's hawk	–	T	G5
Circus cyaneus	Northern harrier	–	SSC	G5
Coturnicops noveboracensis	Yellow rail	–	SSC	G4
Egretta thula	Snowy egret	–	–	G5
Elanus leucurus	White-tailed kite	–	FP	G5
Eremophila alpestris actia	California horned lark	–	–	G5T4Q
Falco mexicanus	Prairie falcon	–	–	G5
Falco peregrinus anatum	American peregrine falcon	D	FP	G4T4
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	–	SSC	G5T3
Haliaeetus leucocephalus	Bald eagle	D	E; FP	G5
Hydroprogne caspia	Caspian tern	–	–	G5
Lanius ludovicianus	Loggerhead shrike	–	SSC	G4
Laterallus jamaicensis coturniculus	California black rail	–	T; FP	G3G4T1
Melospiza melodia	Song sparrow ("Modesto" population)	–	–	G5
Melospiza melodia maxillaris	Suisun song sparrow	–	SSC	G5T3
Melospiza melodia pusillula	Alameda song sparrow	–	SSC	G5T2
Melospiza melodia samuelis	San Pablo song sparrow	–	SSC	G5T2
Nycticorax nycticorax	Black-crowned night heron	–	–	G5
Pandion haliaetus	Osprey	–	CSC	G5
Phalacrocorax auritus	Double-crested cormorant	–	–	G5
Rallus obsoletus obsoletus	California Ridgway's rail	E	E; FP	G5T1
Sterna antillarum (= albifrons) browni	California least tern	E	E; FP	G4T2T3Q
Xanthocephalus xanthocephalus	Yellow-headed blackbird	–	SSC	G5

Scientific Name	Common Name	Federal	State	Global
Antrozous pallidus	Pallid bat	–	SSC	G5
Corynorhinus townsendii townsendii	Townsend's big-eared bat	–	C	G3G4
Dipodomys heermanni berkeleyensis	Berkeley kangaroo rat	–	–	G3G4T1
Lasionycteris noctivagans	Silver-haired bat	–	–	G5
Lasiurus blossevillii	Western red bat	–	SSC	G5
Lasiurus cinereus	Hoary bat	–	–	G5
Microtus californicus sanpabloensis	San Pablo vole	–	SSC	G5T1T2
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	–	SSC	G5T2T3
Nyctinomops macrotis	Big Free-tailed bat	–	SSC	G5
Perognathus inornatus	San Joaquin pocket mouse	–	–	G2G3
Puma concolor	Mountain lion	–	–	–
Reithrodontomys raviventris	Salt marsh harvest mouse	E	E; FP	G1G2
Sorex vagrans halicoetes	Salt marsh wandering shrew	–	SSC	G5T1
Taxidea taxus	American badger	–	SSC	G5
Vulpes macrotis mutica	San Joaquin kit fox	E	T	G4T2

Key

Federal: California Department of Fish and Wildlife. 2018c. *Special Animals List*. Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406.
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
* = Under review for listing under the federal Endangered Species Act.
– = no listing.

State: California Department of Fish and Wildlife. 2018c. *Special Animals List*. Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406.
E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
C = a candidate for listing under the California Endangered Species Act.
SSC = listed as a California species of special concern by the California Department of Fish and Wildlife
FP = listed as a fully protected by the California Department of Fish and Wildlife
– = no listing.

Global: NatureServe. 2018. *Global Conservation Status Definitions*. Available: http://explorer.natureserve.org/granks.htm.
G1 = critically imperiled – high risk of extinction because of extreme rarity (often five or fewer populations)
G2 = imperiled – high risk of extinction because of very restricted range, very few populations (often 20 or fewer populations)
G3 = vulnerable – moderate risk of extinction because of restricted range and very few populations (often 80 or fewer populations)
G4 = apparently secure – uncommon but not rare
G5 = secure – common, widespread, and abundant
G#G# = Range rank; numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community.
? = inexact numeric rank
Q = Questionable taxonomy; taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid.
T# = Infraspecific taxon; the status of infraspecific taxa (subspecies or varieties) indicated by a "T-rank" following the species' global rank.
Rules for assigning T-ranks follow the same principles outlined above for global conservation.
DPS = Distinct Population Segment.

Wildlife Corridors

Wildlife corridors are generally linear regional habitats that provide movement opportunities or connectivity to other natural vegetation communities within a larger landscape that has been fragmented by urban development. Regional wildlife corridors provide foraging, breeding, and cover areas for migrating, dispersing, immigrating, and emigrating wildlife populations and individuals. The baylands surrounding the county's western and northern boundary serves as a migratory corridor for anadromous fish, including green sturgeon, Chinook salmon, steelhead, and lamprey. The riparian woodland community also provides movement corridors for fish and wildlife species. The grassland natural community is an important movement corridor for species such as San Joaquin kit fox, American badger, and Alameda whipsnake; grasslands in the eastern county connect to grassland communities in more southern counties, such as Alameda County and San Joaquin County, providing a movement corridor to greater habitat patches and facilitating a genetic exchange with other populations of San Joaquin kit fox and American badger. Aquatic habitats such as streams and ponds provide breeding habitat for California red-legged frog and California tiger salamander, while the matrix of upland grassland habitats between those aquatic habitats and riparian corridors provide dispersal habitat.

Most of the information about connectivity in the region is from high-level regional modeling (*Critical Linkages: Bay Area and Beyond* [Penrod et al. 2013]) and statewide modeling (*California Essential Habitat Connectivity Project* [Spencer et al. 2010]). Wildlife linkages in the county are shown in Figure 3-5.

The critical linkage modeling maps wildlife linkages that are of high ecological integrity, serving as end points for critical landscape linkages. The linkage model identifies 14 landscape-level connections that are crucial to maintaining connectivity for wildlife between large landscape blocks[6] within and adjacent to the nine-county Bay Area. Two of these linkages overlap the county:

- East Bay Hills: Diablo Range linkage, and
- Mount Diablo: Diablo Range linkage.

The East Bay Hills critical linkage connects habitats in the East Bay hills south of Moraga, through the Diablo Range, and southeast into Alameda County. The southern portion of this linkage is between Orinda and Moraga, on the eastern side of the EBRPD Sibley Volcanic Regional Preserve and Redwood Regional Park. Another linkage in the East Bay Hills links eastern Berkeley, south of Tilden Regional Park, to undeveloped lands northwest of Orinda. The most southern East Bay Hills linkage is identified from Las Trampas Regional Wilderness south into Alameda County. The linkage covers approximately 18 miles in Contra Costa County between Orinda and the southern end of the county.

The Diablo Range critical linkage joins the Altamont Hills region with the protected lands of the Los Vaqueros Watershed in the county. The Altamont Hills are believed to provide an essential link for suitable kit fox habitat in the northern extreme of the species' range (H. T. Harvey & Associates 1997), allowing genetic exchange between kit fox in Contra Costa and Alameda Counties and farther south in San Joaquin, Stanislaus, and Merced Counties. This linkage barely enters the county, covering only approximately 2 miles between Los Vaqueros Reservoir and the southern end of the county.

[6] Protected areas, areas with conservation easements, and roadless areas greater than 500 acres (Penrod et al. 2013).

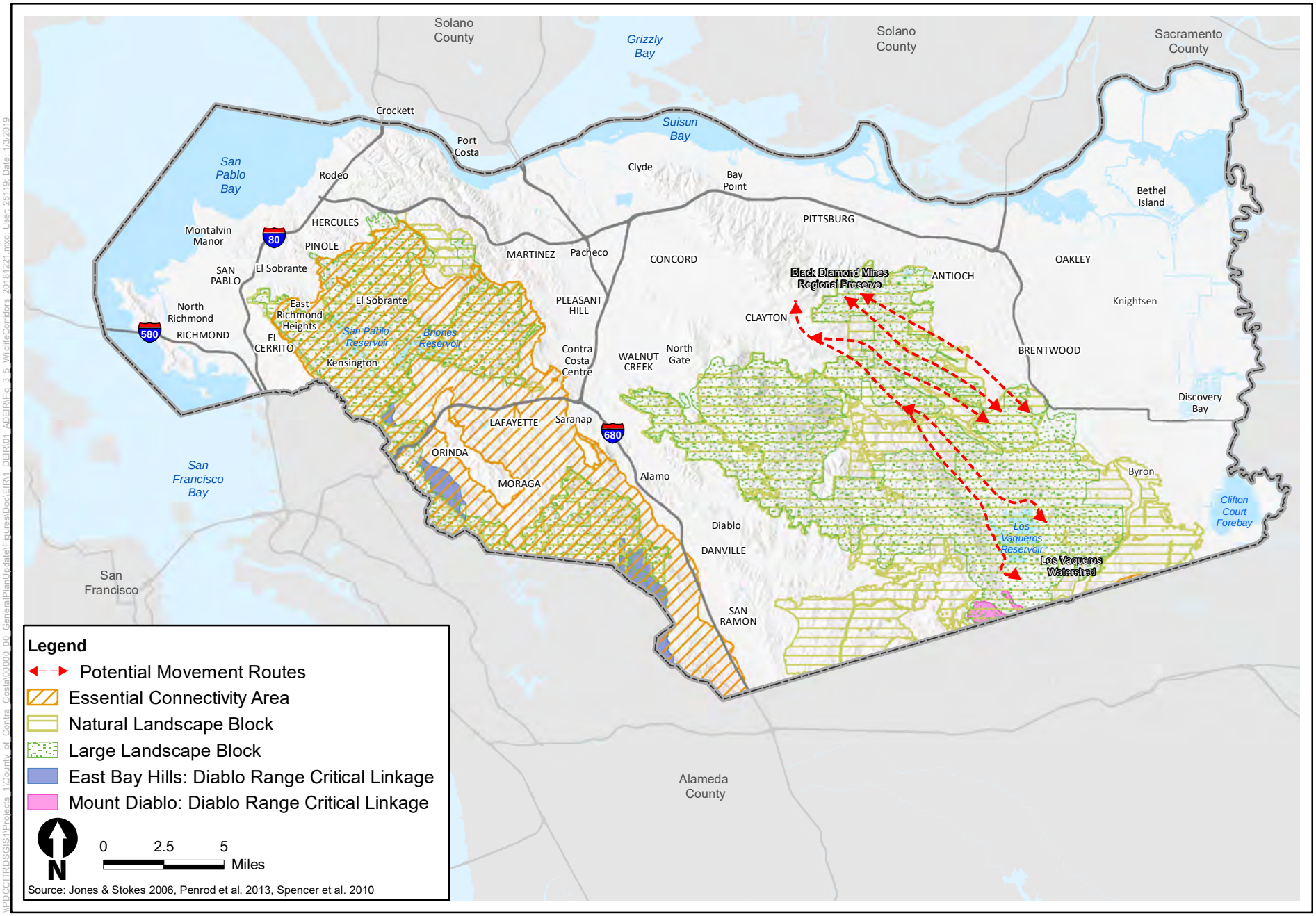


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Figure 3-5
Wildlife Corridors

The California Essential Habitat Connectivity Project identifies natural landscape blocks,[7] which include a combination of protected areas and other areas with intact natural communities that are at low risk of conversion to non-natural communities over time, and essential connectivity areas.[8] Across the Diablo Range in the county, the natural landscape blocks and essential connectivity area overlap. In addition, the HCP/NCCP identified the following potential movement routes between the Los Vaqueros Watershed and Black Diamond Mines Regional Preserve (Jones & Stokes 2006) (Figure 3-5, shown with red arrows):

- **Round Valley.** The southernmost and longest route, at approximately 8 miles, Round Valley is composed primarily annual grasslands, connecting Round Valley to Black Diamond Mines Regional Preserve.
- **Briones Valley.** This approximately 5-mile potential movement route through Briones Valley traverses a portion of the relatively narrow valley, with rural ranchettes in the lower Briones Valley.
- **Deer Valley.** This approximately 4-mile potential movement route through Deer Valley is partially protected by the dedication of development rights on and around Roddy Ranch Golf Course.
- **Horse and Lone Tree Valleys.** Horse and Lone Tree Valleys together form the widest (approximately 5 miles) potential movement route between Black Diamond Mines Regional Preserve and Cowell Ranch State Park.

Sensitive Habitats

For the purposes of this Existing Conditions Report, sensitive habitats were identified using three different sources:

- Contra Costa County General Plan 2005–2020 (Contra Costa County 2005),
- CNDDB (California Department of Fish and Wildlife 2018b), and
- Guidebook to Botanical Priority Protection Areas of the East Bay (Bartosh et al. 2010).

The sensitive habitats described in the sources identified above are not mutually exclusive. Each document was developed at a different time (and may use different data). This Existing Conditions Report does not attempt to make comparisons between the sensitive habitat areas defined in each source identified above.

Contra Costa County General Plan 2005–2020

The 2005–2020 General Plan identifies 41 unique biotic resource areas that have biological and wildlife importance (Figure 3-6). Furthermore, the 2005–2020 General Plan identifies these areas as significant ecological resource areas, most of which contain aquatic habitat, such as freshwater marsh, seasonal and perennial wetlands, alkali mud flats, coastal salt marsh, and riparian vegetation. Examples of significant ecological resource areas with aquatic habitat include the Marsh Creek

[7] Natural habitat blocks that support native biodiversity (Spencer et al. 2010).

[8] Areas essential for ecological connectivity between the natural landscape blocks (Spencer et al. 2010).

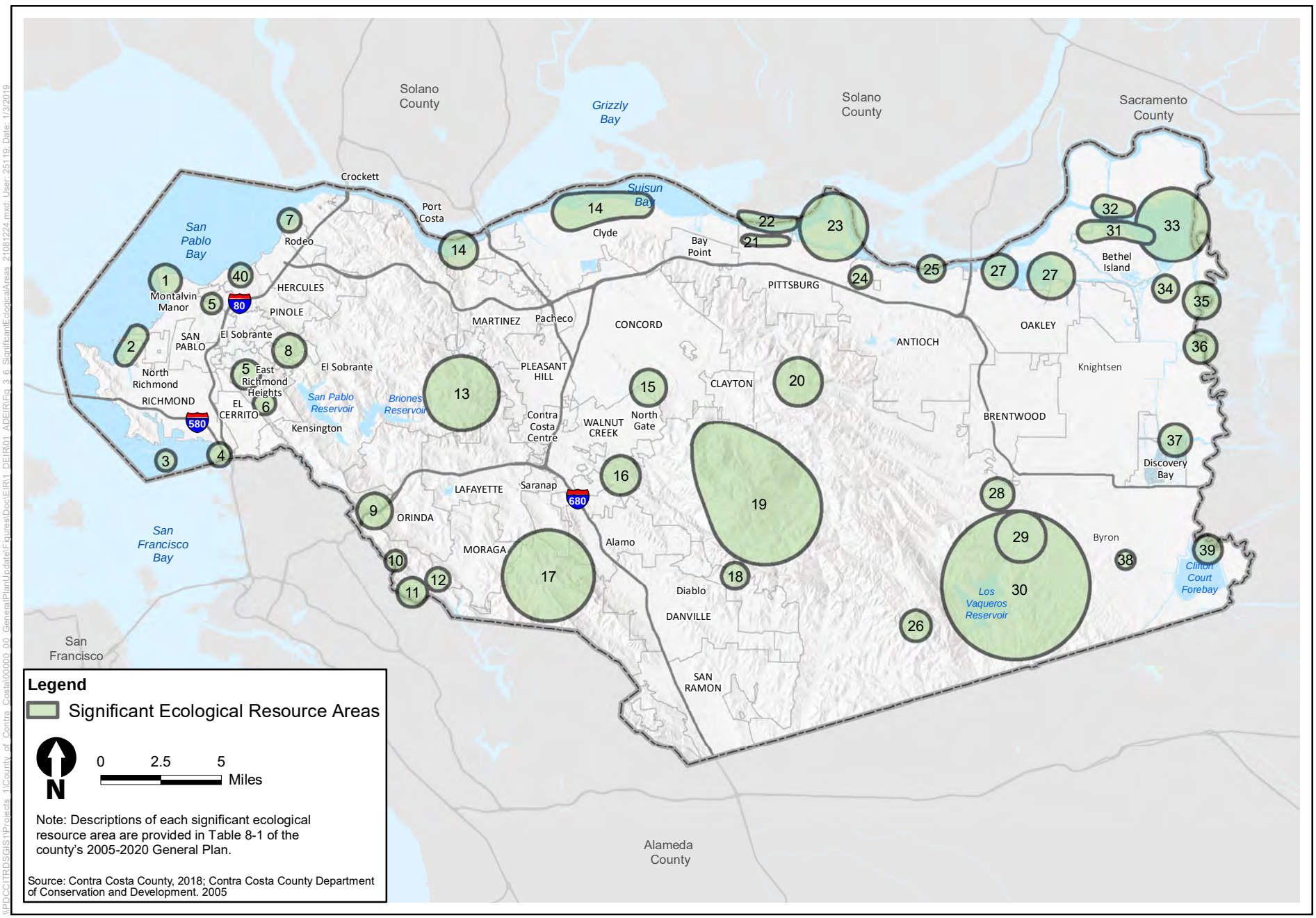

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Figure 3-6
Significant Ecological Resource Areas and Selected Locations of Protected Wildlife and Plant Species Areas

Riparian Corridor, Big Break, Alkali Meadows and Northern Claypan Vernal Pools, Bay Point Salt Marsh, mouth of the Contra Costa Canal, and Brooks Islands. Other locations include a mix of aquatic and upland habitat or are entirely within upland areas. Significant ecological resource areas in upland habitat typically contain unique soil types (e.g., San Pablo Ridge, Shell Ridge, Antioch Sand Dunes, Blackhawk Ranch Fossil Locality), high-quality native habitats, and often special-status species (e.g., Mount Diablo, Las Trampas and Rocky Ridges, Redwood Regional Park, Los Vaqueros Watershed). The habitat constituents within each significant ecological resource area are described in detail in the 2005–2020 General Plan (Contra Costa County 2005, pages 8-5 through 8-7).

California Natural Diversity Database

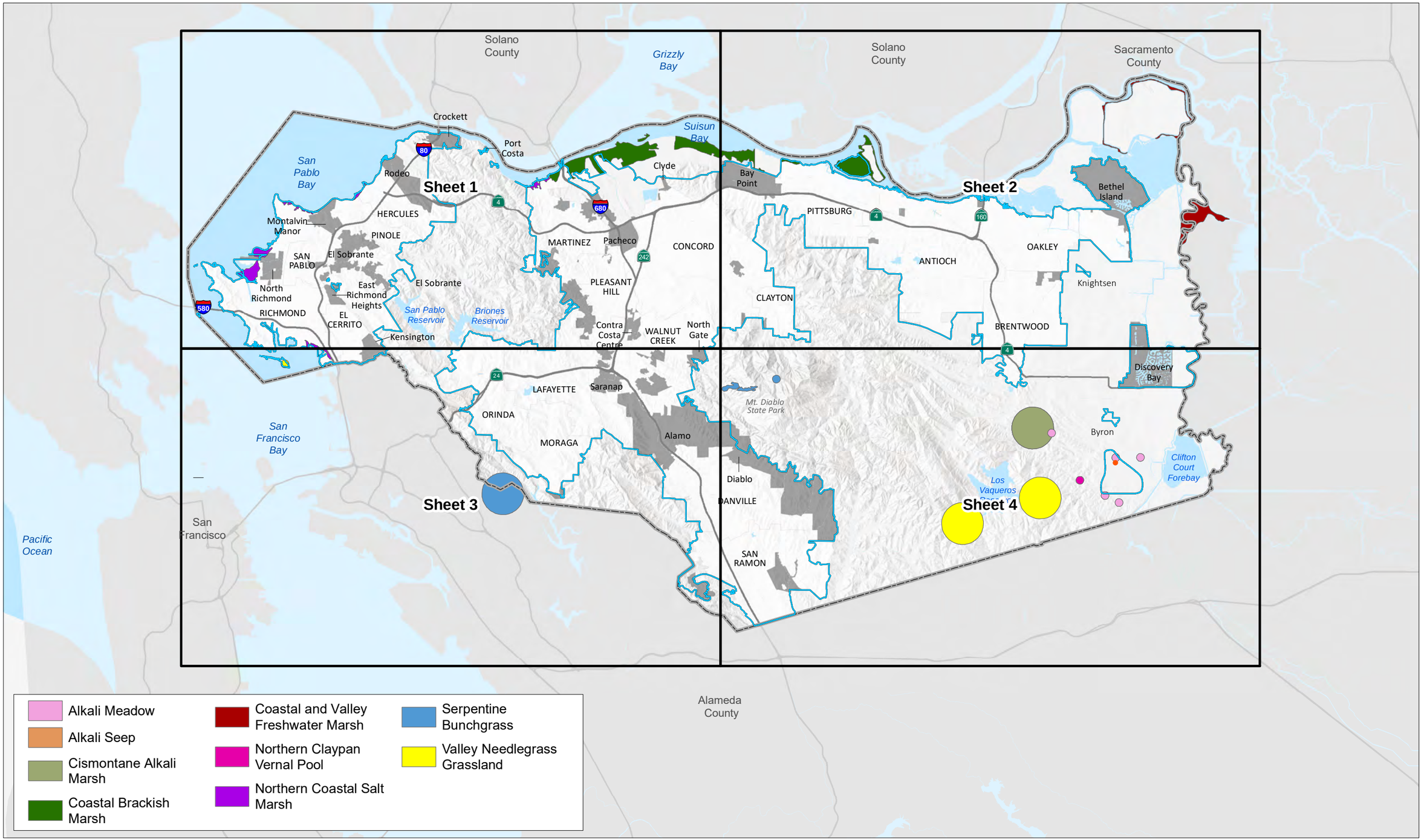
The CNDDB identifies the locations of sensitive natural communities in California, according to their rarity and the threats that may affect them. The rarity of a natural community is defined by its range and distribution as well as the proportion of high-quality occurrences. Threats and trends include factors such as development, agriculture, energy production and mining, and invasive species. The classification of sensitive natural communities is based on the second edition of *A Manual of California Vegetation* (Sawyer et al. 2009). A total of nine sensitive natural communities are mapped in the CNDDB within the county (Figure 3-7). The name and acreage of each sensitive natural community are provided in Table 3-3.

Table 3-3. Sensitive Natural Communities in Contra Costa County

Type	Acres
Alkali Meadow	2,326
Alkali Seep	1,978
Cismontane Alkali Marsh	1,978
Coastal Brackish Marsh	5,02
Coastal and Valley Freshwater Marsh	4,168
Northern Claypan Vernal Pool	70
Northern Coastal Salt Marsh	903
Serpentine Bunchgrass	819
Valley Needlegrass Grassland	4,025
Total	**16,767**

California Department of Fish and Wildlife, 2018a.

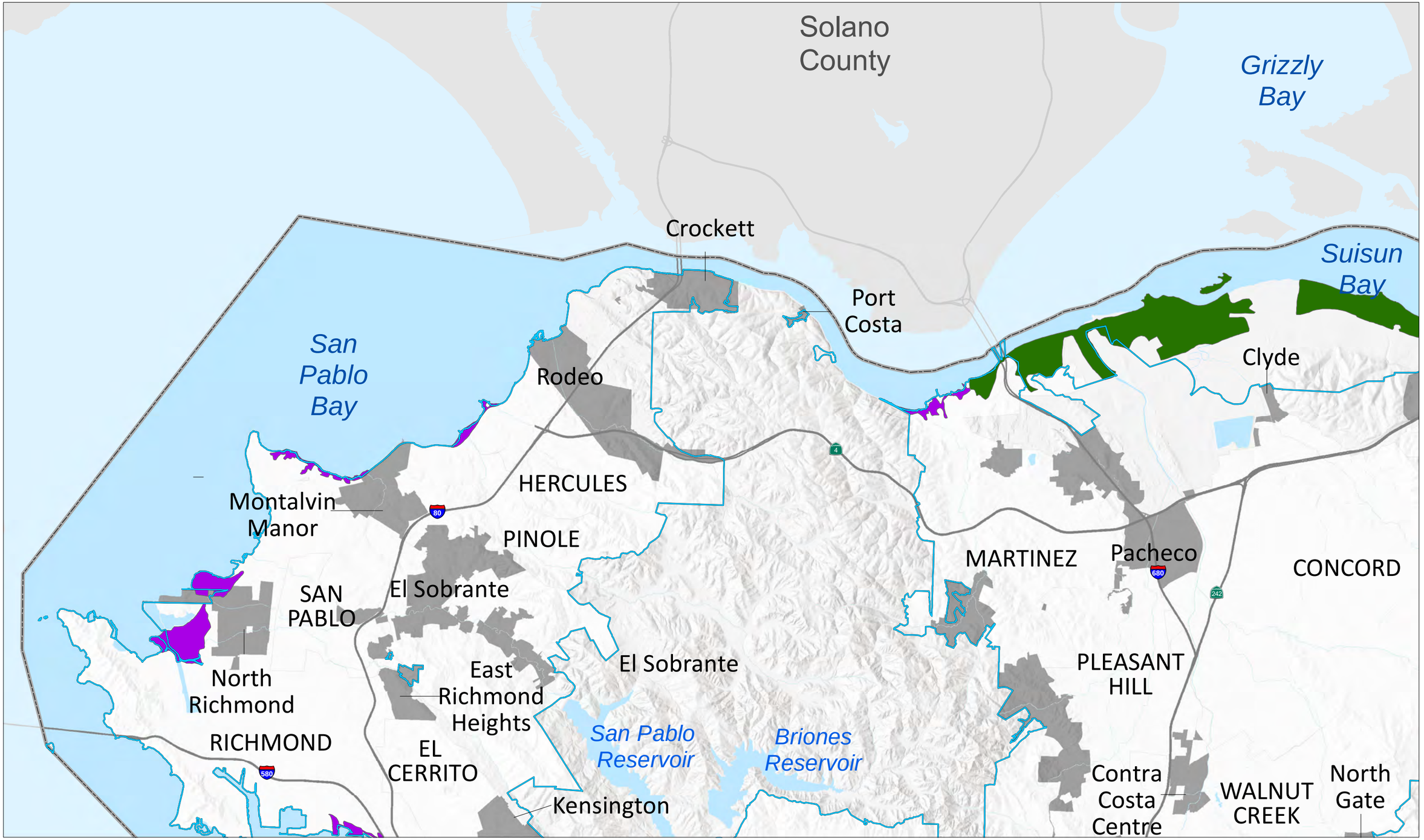
All but two of these communities are aquatic; thus, most of the sensitive natural communities are located along the edge of the Delta and/or San Francisco Bay. The eastern portion of the county, in the vicinity of the Los Vaqueros Watershed and Bryon Hills/Vasco Caves, is also a hot spot for sensitive habitats. It contains one of the upland vegetation communities, valley needlegrass grassland. The other upland community, serpentine bunchgrass, is found on the Contra Costa-Alameda County boundary, southwest of the cities in vicinity of Oakland. All of the communities are described in detail below.



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: The following sheets provide a detailed map of each quadrant of the County.

Figure 3-7
Overview Map
Sensitive Natural Communities



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

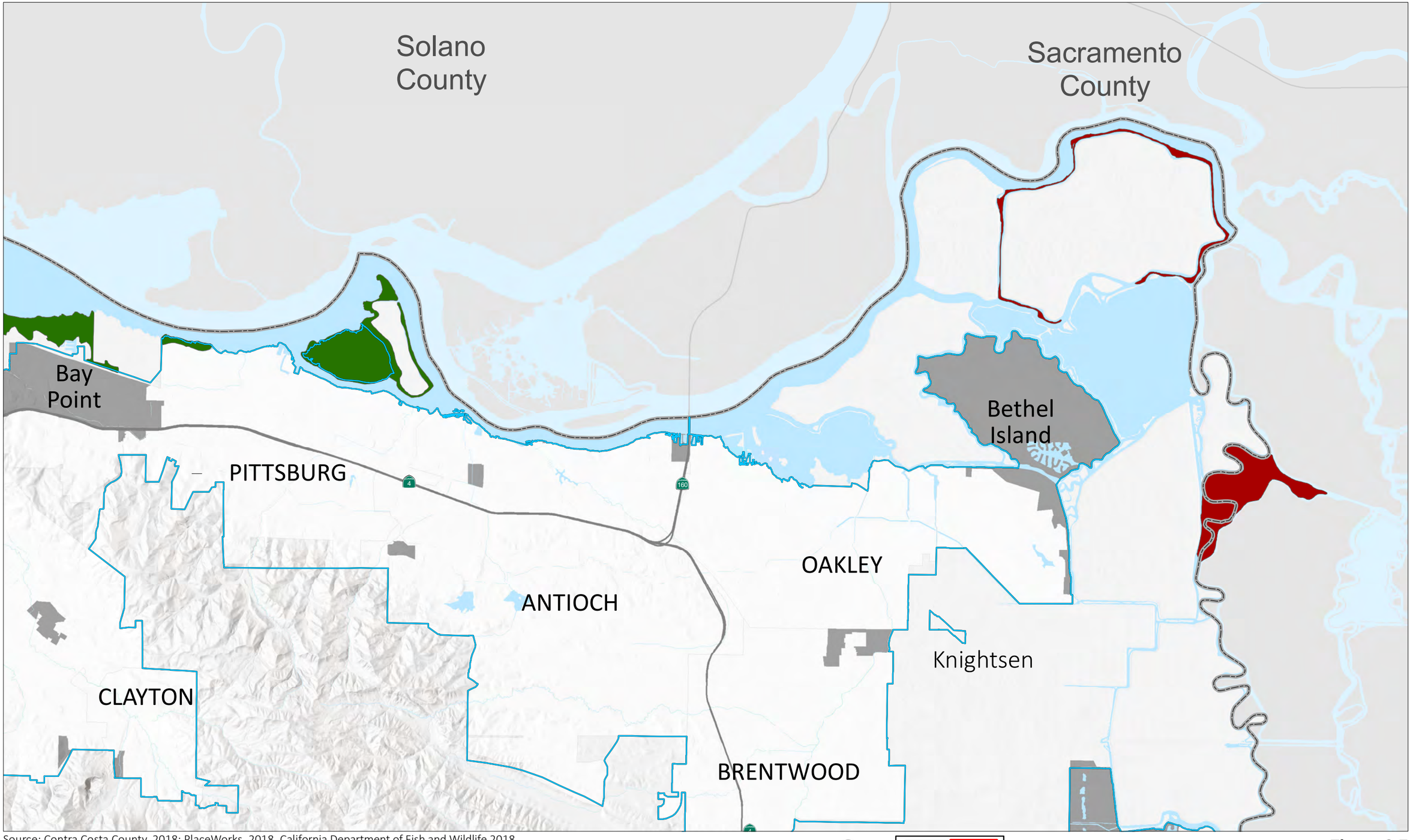
0 0.75 1.5 3
Miles

N

1 2 3 4

Note: See Legend on Overview Map

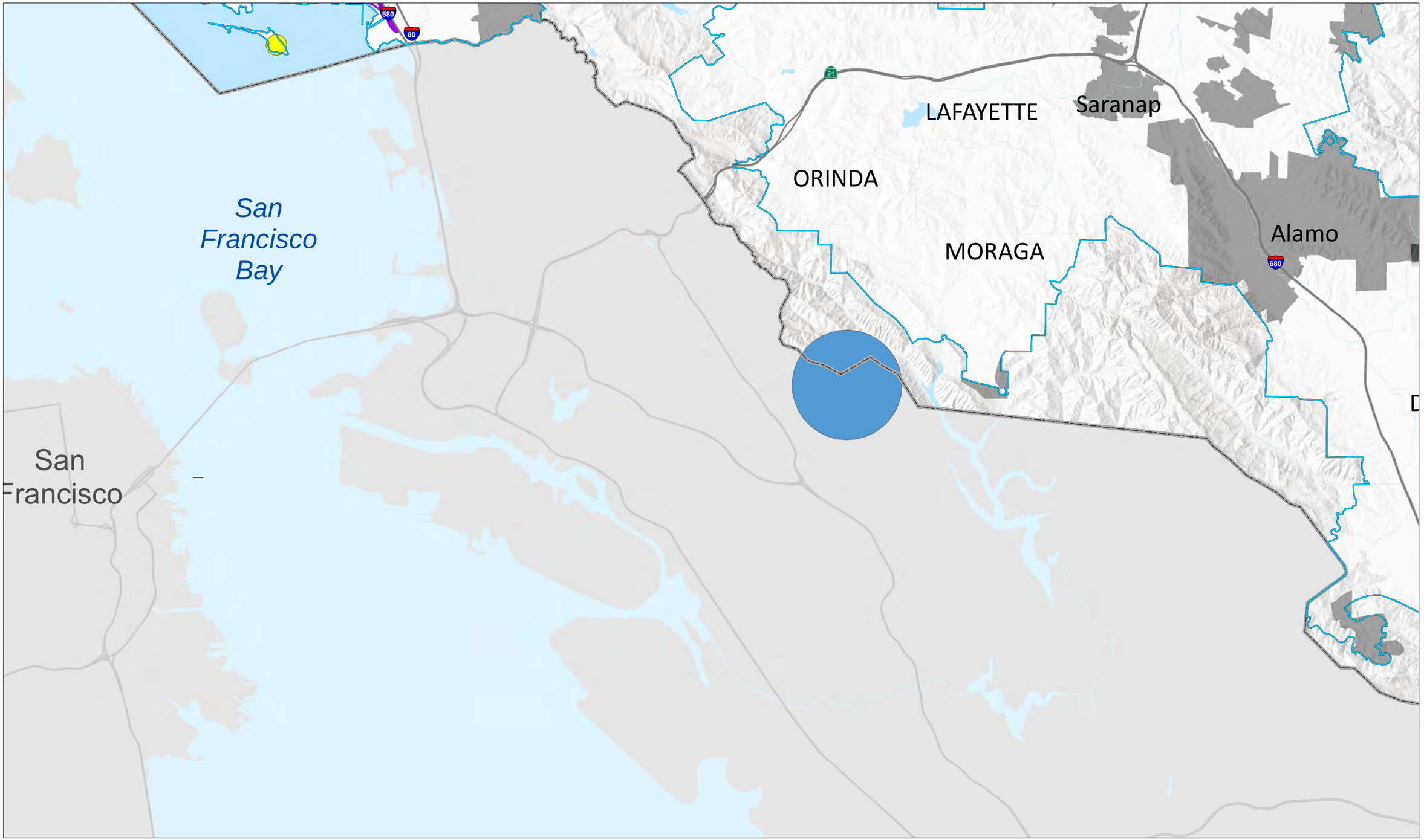
Figure 3-7
Sheet 1
Sensitive Natural Communities



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See Legend on Overview Map

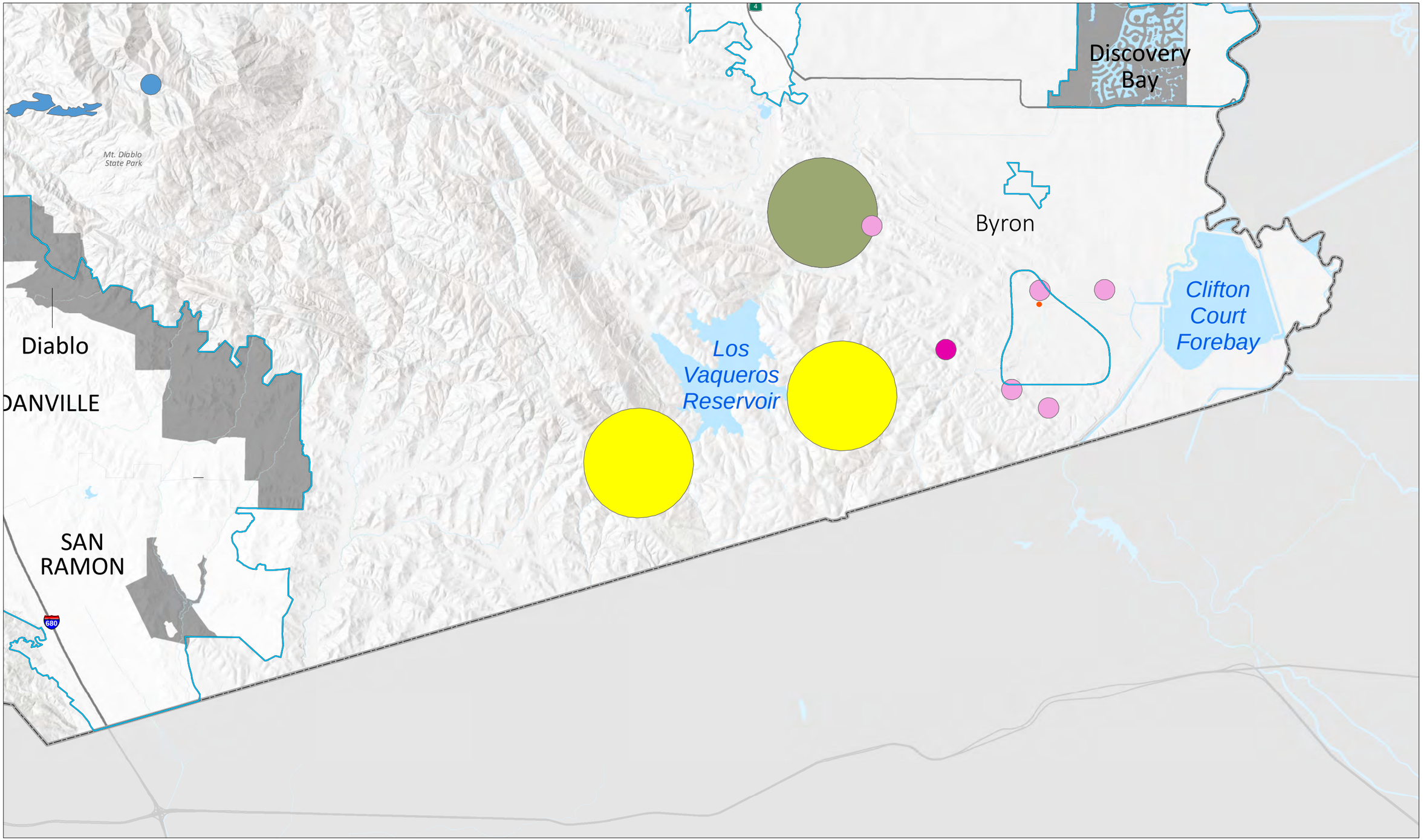
Figure 3-7
Sheet 2
Sensitive Natural Communities



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

Note: See Legend on Overview Map

Figure 3-7
Sheet 3
Sensitive Natural Communities



Source: Contra Costa County, 2018; PlaceWorks, 2018, California Department of Fish and Wildlife 2018

0 0.75 1.5 3 Miles

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Note: See Legend on Overview Map

1 2 3 4

Figure 3-7
Sheet 4
Sensitive Natural Communities

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Alkali Meadow

Alkali meadows occur in areas where the water table is shallow (3 to 10 feet deep) and soils are alkaline. Alkali wetlands support ponded or saturated soil conditions and occur as perennial or seasonally wet features. The dominant cover is in the form of grasslands. Alkali meadow occupies approximately 2,326 acres (0.45%) in the county. Alkali wetland vegetation is composed of halophytic plant species that are adapted to both wetland conditions and high salinity levels. Grasses that grow on alkali soils include saltgrass (*Distichlis spicata*), wild barley (*Hordeum vulgare*), and alkali ryegrass (*Leymus triticoides*). The associated herb cover also consists of halophytes, including saltbush (*Atriplex* spp.), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), alkali mallow (*Malvella leprosa*), and common spikeweed (*Centromadia pungens*). Alkali wetlands provide function and value for wildlife, similar to the function and value provided by seasonal wetlands. The array of wildlife species found in seasonal wetlands is also found in alkali wetlands (Jones & Stokes 2006; ICF International 2010).

Alkali Seep

Alkali seeps are areas where water penetrates the alkali soil surface and creates a small wetland. These provide a source of drinking water for wildlife in the area (ICF International 2012). Alkali seeps occupy approximately 1.978 acres (0.39%) in the county. Alkali seeps typically occur within a matrix of alkali meadows or grasslands. Alkali seeps are halophytic plant species that have adapted to both wetland conditions and high salinity levels, such as salt grass or alkali heath (ICF International 2012). Alkali seeps contain vegetation that is very similar to the alkali wetland, described above.

Cismontane Alkali Marsh

Cistmontane alkali marshes occur on alkali soils associated with canyons or higher-elevation streams, often surrounded by woodlands (California Department of Fish and Wildlife 2018b). In the county, they would most likely be surrounded by oak woodland (*Quercus* spp.). Cismontane alkali marsh occupies approximately 1.978 acres (0.39%) in the county. Cismontane alkali marsh contains vegetation that is very similar to the alkali wetland, described above.

Coastal Brackish Marsh

Coastal brackish marsh is found below the high-tide line where fresh water and sea water mix (typically in estuaries); therefore, the salinity levels are diluted. This typically occurs near coastal bays, coastal rivers, estuaries, and coastal lagoons. Cismontane alkali marsh occupies approximately 502 acres (0.10%) in the county. Coastal brackish marsh includes both halophytic and freshwater vegetation. The species include those described below under both coastal and valley freshwater marsh and northern coastal salt marsh, although, typically, the species are perennial emergent species such as cattails (*Typha* spp.), bulrush (*Bolboschoenus* spp.), or pickleweed (*Salicornia* spp.) (Holland 1986).

Coastal and Valley Freshwater Marsh

Coastal and valley freshwater marsh is dominated by emergent herbaceous plants (reeds, sedges, grasses), with either intermittently flooded or perennially saturated soils. Freshwater marshes are found throughout the coastal drainages of California—wherever water slows down and

accumulates, even on a temporary or seasonal basis. A freshwater marsh usually features shallow water that is often clogged with dense masses of vegetation, resulting in deep peaty soils. Coastal and valley freshwater marsh occupies approximately 4,168 acres (0.81%) in the county. The plant species common to coastal and valley freshwater marsh consist predominantly of cattails (*Typha* spp.), bulrushes (*Schoenoplectus* and *Bolboschoenus* spp.), sedges (*Carex* spp.), and rushes (*Juncus* spp.). The dominant species in the perennial freshwater wetland in the study area include rabbitsfoot grass (*Polypogon* sp.), nutsedge (*Cyperus eragrostis*), willow weed (*Persicaria lapathifolia* [*Polygonum lapathifolium*]), and water cress (*Rorippa* spp.). Broadleaf cattail (*Typha latifolia*) and water-primrose (*Ludwigia* spp.) are common associates (Jones & Stokes 2000 [in ICF International 2012]). The dominant species in the nontidal freshwater marsh are narrow-leaved cattail (*Typha angustifolia*), rice cutgrass (*Leersia oryzoides*), bur-reed (*Sparganium eurycarpum*), alkali bulrush (*Bolboschoenus* [*Scirpus*] *robustus*), and perennial peppergrass (*Lepidium latifolium*) (Jones & Stokes 2002 [in ICF International 2012]).

Northern Claypan Vernal Pool

Northern claypan vernal pools are areas that pond water on the surface for extended durations during winter and spring and dry completely during late spring and summer. Northern claypan vernal pool occupies approximately 70 acres (0.01%) in the county and occurs on distinctive topographical areas with low depressions mixed with hummocks or mounds. Because of their unique hydrology, vernal pools support specialized plants that have adapted to growing in these stressful conditions, such as coyote thistle (*Eryngium* spp.), goldfields (*Lasthenia* spp.), downingia (*Downingia* spp.), and navarretia (*Navarretia* spp.). These species are generally restricted or nearly restricted to vernal pools. A number of special-status invertebrates, including vernal pool fairy shrimp (*Brachinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), and longhorn fairy shrimp (Brachinecta longiantenna), may occur in vernal pools (Jones & Stokes 2006).

Northern Coastal Salt Marsh

Northern coast salt marsh contains halophytic wetland vegetation (i.e., plants that grow in high-salinity water) below the high-tide line that is subject to the ebb and flow of daily tides in an area commonly referred to as the marsh plain. Northern coast salt marsh occupies approximately 903 acres (0.18%) in the county. Northern coast salt marsh colonizes microhabitats along the bay, depending on tidal elevations and drainage patterns. Northern coast salt marsh in the lowest, wettest portion of the marsh, where inundation/saturation is nearly permanent, typically includes California cordgrass (*Spartina foliosa*), pickleweed (*Salicornia* spp.), saltmarsh bulrush (*Bolboschoenus robustus*), and tules (*Schoenoplectus* spp.). Northern coast salt marsh is typically most expansive in the middle marsh. In these broad, nearly flat areas, dense woody pickleweed vegetation dominates the landscape, mixed with scattered patches of salt marsh dodder (*Cuscuta salina*), jaumea (*Jaumea carnosa*), alkali-heath (*Frankenia salina*), and saltgrass. Often referred to as tidal plains, the middle marsh typically floods during higher tides but is not continually inundated or saturated. Higher marsh occurs in drier areas above the mean high-water level along elevated or better-drained sediment deposits. These areas can be dominated by marsh gumplant, non-native grasses, marsh bacchris, and coyote brush and integrate with coastal freshwater habitats (San Francisco Estuary Institute 2011).

Serpentine Bunchgrass

The serpentine bunchgrass is a grassland that occurs on serpentine soils. Serpentine bunchgrass occupies approximately 819 acres (0.16%) in the county. Many serpentine species are partially or completely confined to this substrate (Safford et al. 2005). The composition of native bunchgrass species in serpentine bunchgrass is generally similar to that in non-serpentine habitats, although serpentine populations may be more tolerant of the heavy metals present in the soil and may have lower growth rates compared with non-serpentine populations (Huntsinger et al. 1996).

Serpentine bunchgrass is generally a mosaic of perennial bunchgrass stands and mixed assemblages of perennial and annual grass and herbaceous wildflower species (McCarten 1987). Characteristic grass species in serpentine grassland include big squirreltail (*Elymus multisetus*), California melic grass (*Melica californica*), California oat grass (*Danthonia californica*), fringed checkerbloom (*Sidalcea diploscypha*), jeweled onion (*Allium serra*), June grass (*Koeleria macrantha*), one-sided bluegrass (Poa secunda), purple needlegrass (*Stipa pulchra*), San Franciscan wallflower (*Erysimum franciscanum*), serpentine leptosiphon (*Leptosiphon ambiguus*), and squirreltail (*Elymus elymoides*) (Evens and San 2004). California goldfields (*Lasthenia californica* ssp. *californica*), California poppy, hayfield tarweed (*Hemizonia congesta*), purple owl's-clover (*Castilleja exserta*), rosin weed (*Calycadenia truncata*), and tidy-tips (*Layia platyglossa*) are wildflowers that often form patches of color within the grassland matrix. The flora is composed primarily of native species (although non-native species such as soft chess can also be common) and generally more diverse than the flora of grasslands on non-serpentine substrates (McNaughton 1968).

Valley Needlegrass Grassland

Valley needlegrass grasslands are areas where purple needlegrass is dominant or co-dominant with California melic grass or Torrey's melicagrass (*Melica torreyana*). Valley needlegrass grassland occupies approximately 4,025 acres (0.78%) in the county. Purple needlegrass is typically mixed with non-native annual grass species, such as oat grass (*Avena* spp.), brome (*Bromus* spp.), and barley (*Hordeum* spp.); perennial grasses, such as rygrass (*Elymus* spp.) and June grass (*Koeleria macrantha*); herbs, such as goldfields (*Lasthenia* spp.), filaree (*Erodium* spp.), and sanicle (*Saincula* spp.); blue-eyed grass (*Sisyrinchium bellum*); and clover (*Trifolium* spp.) It also occurs as a relatively dense patch surrounded by annual grasses. Valley needlegrass grassland is found on all topographic locations. The ssoils, which have a high clay content, may be loamy, sandy, or silty and derived from mudstone, sandstone, or serpentine substrates. Emergent trees and shrubs may be present as low cover (Sawyer et al. 2009).

Guidebook to Botanical Priority Protection Areas of the East Bay

A Guidebook to Botanical Priority Protection Areas of the East Bay (Guidebook) establishes Botanical Priority Protection Areas (BPPAs), which are unprotected botanical hot spots that contain sensitive botanical resources, including sensitive natural communities, special-status plant species, and historic occurrences of special-status plant species. A total of seven BPPAs (141,293 acres) have been mapped in the county, as shown in Table 3-4.

Table 3-4. Botanical Priority Protection Areas in Contra Costa County

Name	Location	Acres
Concord Naval Weapons Station	City of Concord	8,701
Delta	Unincorporated County Area	61,631
Four Valleys	City of Antioch	13,052
Marsh Creek	Unincorporated County Area	14,921
North of Mount Diablo	City of Clayton	6.776
Richmond Shoreline	City of Richmond	1,723
Sobrante Ridge	City of Richmond	801
Total		**141,293**

Source: Bartosh et al., 2010.

These areas represent the wide range of habitat in the county for special-status plant species. The BPPAs in the western portion of the county are smaller because of urbanization along San Francisco Bay, with little land remaining that can be protected. As discussed above in the *Special-Status Species* section, the vast expanses of undeveloped land in the eastern portion of the county contain greater habitat diversity and greater numbers of native plant species; therefore, larger BPPAs flank the Diablo Range. The BPPAs exclude land that was previously preserved. The Guidebook, which includes figures and a description of each BPPA, is included in Appendix A, *Guidebook to Botanical Priority Protection Areas of the East Bay* (Bartosh et al. 2010).

Chapter 4
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Appendix A

Guidebook to Botanical Priority Protection Areas of the East Bay

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A Guidebook to

Botanical Priority Protection Areas of the East Bay

By Heath Bartosh Lech Naumovich Laura Baker

East Bay Chapter of the California Native Plant Society



EAST BAY CNPS

A Guidebook to Botanical Priority Protection Areas of the East Bay

Special Publication # 4 of the California Native Plant Society East Bay Chapter

By Heath Bartosh Lech Naumovich Laura Baker

East Bay Chapter of the California Native Plant Society

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Literature citation should read as: Bartosh H., Naumovich L., and Baker L. 2010. A Guidebook to Botanical Priority Protection Areas of the East Bay. East Bay Chapter of the California Native Plant Society.

CNPS - Dedicated to the preservation of California native flora

EAST BAY CNPS

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Introduction

The lands that comprise the East Bay Chapter are located at the convergence of the San Francisco Bay, the North and South Coast Ranges, the Sacramento-San Joaquin Delta, and the San Joaquin Valley. The East Bay Chapter area supports a unique congregation of ecological conditions and native plants. Based on historic botanical collections, the pressures from growth-based Bay Area economies have buried many of the botanical treasures of the East Bay. The collision of floristic protection and economic growth conceived the Botanical Priority Protection Areas Project (BPPA), and fortified intra-chapter collaboration between the Plant Science and Conservation arms of the East Bay Chapter of the California Native Plant Society (CNPS).

In January of 2006, the Bay Area Open Space Council (BAOSC) requested that our chapter provide them a list of important botanical areas. Our botanical priorities were to be incorporated into BAOSC's Upland Habitat Goals Project which aims to increase the acreage of protected lands and develop an increased awareness of key habitats among land management agencies and local jurisdictions. We had only one day to accomplish the difficult task of choosing between many botanically rich areas of Alameda and Contra Costa counties. At the end of the day, after a flurry of emails, fifteen areas endowed with native plant diversity that are threatened by current and potential land-use decisions were hastily identified.

This inquiry and resulting cache of botanical areas begged another question: how can we look at these areas through a more objective lens utilizing existing information? To answer this initial question, the project began as a simple Geographic Information System (GIS) exercise. Heath Bartosh, the chapter's Rare Plant Committee Chairman, began by mapping primarily watershed-based boundaries of each protection area.

Overall, the 15 BPPAs comprise 238,225 acres (372 square miles) in Alameda (96,932 acres) and Contra Costa (141,293 acres) counties. The BPPAs occupying the western portion of the chapter are smaller in acreage due the urbanization that has already occurred along the bayside flatlands leaving diminutive botanical refugia still in need of protection. In the east, vast expanses of undeveloped land containing a broader diversity of habitats and native plant species are still intact as characterized by the larger BPPAs found flanking the Diablo Range.

BPPA boundaries were drawn with the intention of excluding lands previously preserved, such as Mount Diablo State Park or lands owned and managed by the East Bay Regional Park District. However, certain BPPAs include public parcels or properties with other conservation status. These are cases where land has been conserved since the creation of these boundaries or where potential management decisions have the potential to negatively affect an area's botanical resources. Additionally, each acre within these BPPAs represents a *potential* area of high priority. Both urban and natural settings are included within these boundaries, therefore, they are intended to be considered as areas warranting further scrutiny due to the abundance of nearby sensitive botanical resources supported by high quality habitat within each BPPA. Although a parcel, available for preservation through fee title purchase or conservation easement, may be located within the boundaries of a BPPA, this does not by default indicate that it contains sensitive botanical resources. Parcels within each BPPA should be floristically evaluated on a case-by-case basis to determine their botanical resource value before any conservation activity, land-use change, or development is undertaken.

From within these boundaries an analysis was executed of readily and freely available spatial datasets such as botanical resource occurrences, substrates (soils and geology), wetlands, urbanized areas, existing protected areas, and possible threats. From these analyses each of the 15 maps includes a summary table that provides information such as the size of the area, watershed information, relevant substrate information, and botanical resource attributes.

The graphic portion of each map showcases protection areas on a 2009 aerial photograph provided by the National Agriculture Inventory Program. Certain BPPAs include areas of edaphic substrates which strongly influence plant species composition and structure. The East Bay is bestowed with significant substrates such as alkaline soils, sandy soils, and serpentinitic habitats. Within a specific BPPA, edaphic substrates were spatially analyzed using Farmland Mapping and Monitoring Program (FMMP) data. The most useful component of the FMMP data locates areas of urbanization and irrigated agriculture. These aspects of the human environment including development and alteration of vegetative cover, soil structure and hydrology have eroded the natural habitat that native plants need to persist. Spatially analyzing edaphic substrate data against select FMMP data shows the amount of these substrates that have been lost due to post-industrial. For example, 17,280 acres of the alkaline soils have been mapped within all East Bay BPPAs. Of those acres, 21 percent containing alkaline soils within our BPPAs have been lost. Although sandy soils within our chapter area are restricted to Contra Costa County, at one time they represented 24,726 acres. To date, at least 33 percent of sandy soils no longer support healthy native communities of plants. Serpentine substrates manifest themselves in three of the 15 BPPAs: Cedar Mountain, Marsh Creek, and North of Mount Diablo. However, none of these habitats has been as significantly impacted as the large serpentine bodies of the Berkeley and Oakland Hills have been from residential development.

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Following this initial mapping effort, the East Bay Chapter's Conservation Committee began to utilize the concept in draft form in key local planning efforts. Lech Naumovich, the chapter's Conservation Analyst staff person, showcased the map set in forums such as the BAOSC's Upland Habitat Goals Project and the Green Vision Group (in association with Greenbelt Alliance); East Bay Regional Park District's Master Plan Process; and local municipalities. In the near future we anticipate these BPPAs will be incorporated into the Eastern Alameda County Conservation Strategy, a regional planning effort currently being developed.

As a result of this collaboration our chapter also secured grant funding from the Tides and Rose Foundations to prepare this guidebook of these BPPAs. This guidebook includes maps of the 15 BPPAs, which appear opposite pictorial and narrative treatments. These treatments include a written contribution from a guest author, lists and photographs of sensitive botanical resources, a portrayal of the subject areas' botanical hot spots and noteworthy collection history, and a discussion of threats, opportunities, and constraints unique to each area. With the exception of the guest authors' contributions, the remaining text appearing in the green boxes was written by lead authors Mr. Bartosh, Mr. Naumovich, and Conservation Committee Chairperson, Laura Baker.





As an enticement to professionals and laypeople alike, our guest authors contributed their personal impressions of these areas and why they are important as native plant refugia. Their contributions appear at the top of the page to provide the reader "A Sense of Place" relative to each BPPA. The guest authors include a broad spectrum of individuals ranging from dedicated amateur botanists, established academics, and government regulators. They were provided a list of interview questions to elicit a connection to the BPPA that would appeal to both native plant neophytes and seasoned enthusiasts. These questions were formed into a short paragraph that portrays their impressions and importance of the BPPA. Due to layout restrictions, many of the guest authors' pieces appearing in this guidebook are abridged versions. Each of the guest author's entire narratives will be published separately in coming issues of the East Bay Chapter's newsletter, the *Bay Leaf.*

Botanical Priority Protection Areas

Alameda and Contra Costa Counties

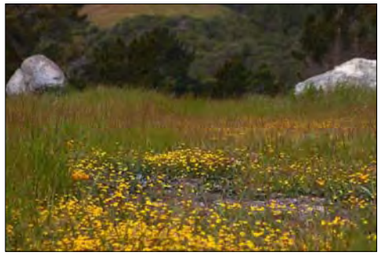
Each BPPA includes a list of sensitive botanical resources that have been given listing status and comprise: one sensitive natural community; four plant species that are either statewide or locally rare and considered extant; and one historic occurrence that has not been seen for a minimum of 40 years. A section on the botanical hot spots within the BPPA is included that addresses the general locations of this list of botanical resources and colorful collection anecdotes. This list is also accompanied by photos of selected species within each BPPA.

An understanding of listing status in California and its regulatory significance is important to understanding the text below that deals with various rankings. Listing status is given for specific vegetation types and native plant species that meet a certain set of criteria. Within our chapter area we recognize three types of listing status: Sensitive Natural Communities; Special-Status Plant Species; and Locally Rare Plant Species. These designations support our labeling of the 15 botanical areas as priorities for protection.

Typically, vegetation types that are given an elevated listing status are referred to as Sensitive Natural Communities. Sensitive Natural Communities are characterized as plant assemblages that are unique in constituent components, restricted in distribution, supported by distinctive edaphic conditions, considered locally rare, potentially support special-status plant or wildlife species and/or receive regulatory protection from municipal, county, state and/or federal entities. The California Natural Diversity Database treats a number of natural communities as rare, which are given the highest inventory priority. Current vegetation types treated as Sensitive Natural Communities appear in the California Department of Fish and Game (CDFG) Vegetation Mapping and Classification Program's *List of California Vegetation Alliances*.

Special-status plant species are those considered listed as Endangered, Threatened, or Rare by the U.S. Fish and Wildlife Service and/or by the CDFG. Regulatory statues that have designated certain plant species as having special-status include: Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), California Fish and Game Code, and the Native Plant Protection Act (NPPA) of 1977.

In addition, CNPS has developed and maintains a list of rare, Threatened and Endangered plants of California. This information is published in the *Inventory of Rare and Endangered Vascular Plants of California*. The CNPS list is endorsed by the CDFG and effectively serves as its list of "candidate" plant species. The following identifies the definitions of the CNPS listings:



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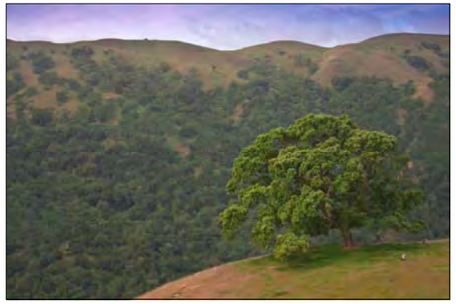



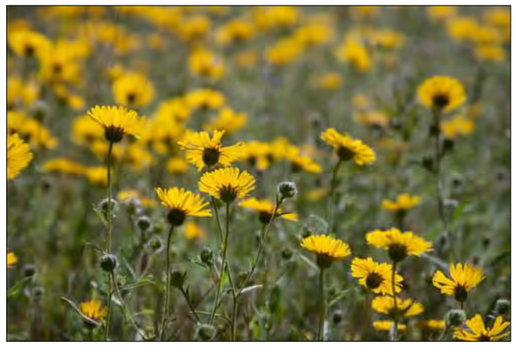

List 1A: Plants presumed to be extinct in California;

List 1B: Plants that are rare, Threatened, or Endangered in California and elsewhere;

List 2: Plants that are rare, Threatened, or Endangered in California, but are more numerous elsewhere;

List 3: Plants about which more information is needed (a review list); and

List 4: Plants of limited distribution (a watch list).

CNPS List 1B and List 2 species are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code. As part of the CEQA process, such species should be fully considered, as they meet the definition of Threatened or Endangered under the NPPA and Sections 2062 and 2067 of the California Fish and Game Code. CNPS List 3 and List 4 species are considered to be either plants about which more information is needed or are uncommon enough that their status should be regularly monitored. Such plants may be eligible or may become eligible for state listing, and CNPS and CDFG recommend that these species be evaluated for consideration during the preparation of California Environmental Quality Act (CEQA) documents, as some of these species may meet NPPA and CESA criteria as Threatened or Endangered.

Locally rare plant species are those considered to be: 1) at the outer limits of their known distribution; 2) a range extension; 3) a rediscovery; or 4) rare or uncommon in a local context. All of these are tracked in Alameda and Contra Costa counties by the East Bay chapter of CNPS and published in *Rare, Unusual, and Significant Plants of Alameda and Contra Costa Counties*. Through this program, the East Bay Chapter has been divided into 40 botanical regions based on vegetation, geology, habitats, soil types, climate, and other factors.

Although not regarded as special-status species by the USFWS or CDFG, locally rare plants can receive regulatory protection, through CEQA's Article 9 and Guidelines §15125(a) and §15380 which state that "special emphasis should be placed on environmental resources that are rare or unique to that region." CNPS also has the stated goal of "preserving plant biodiversity on a regional and local scale." Relying on these statements the East Bay Chapter of CNPS maintains a program, started in 1991, that tracks rare, unusual, and significant plants that occur within our chapter.

Anthropogenic and environmental threats are a common thread to each BPPA. The inclusion of a discussion of threats, opportunities, and constraints highlights current conservation issues and conveys why these areas need protection. We hope to highlight some of the current, relevant environmental impacts facing the BPPAs, as well as introduce some of the cooperative efforts that are helping bring attention and protection to the unique botanical values of the sites.

Our chapter is keenly aware of the challenge facing us as we try to cope with the push to accommodate a growing tide of population drawn to the beauty of our unique East Bay landscape. California's most enduring but ironically tragic character flaw is that it draws many people to a place of delicate and finite natural resources. With our guidebook, we hope to provide local governments and land managers enough information to make botanically conscious land-use decisions so that our beloved botanical treasure box will bend, not break, under the weight of its growing human population.

This project has been supported by funding from the Rose Foundation, the Tides Foundation, and the East Bay Chapter of CNPS.

For information on this project please contact Heath Bartosh, East Bay Chapter Rare Plant Botanist. hbartosh@nomadecology.com or Lech Naumovich, East Bay Chapter Conservation Analyst conservation@ebcnps.org.



Water body and waterway data furnished by Contra Costa information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Botanical Priority Protection Area	
Altamont	
Size	29,178 Acres
Watershed Information	
Watershed Based	YES - Partial
Watersheds	Bethany Reservoir Mountain House Patterson Run Delta
Significant Substrates	
Total Alkaline Soils	928 Acres
Alkaline Soils Extirpated	10%
Alkaline Soils Extant	90%
Botanical Attributes	
Locally Rare Plant Occurrences	12
CNDDB Plant Occurrences	6
State or Federally Listed Plant Populations	5
CNDDB Community Occurrences	1



San Joaquin

Mountain House

580

Patterson Pass

Byron Conservation Bank

Bethany Reservoir

Byron Airport CE

Vasco Caves

Brushy Peak

Altamont

Botanical Priority Protection Areas

Legend

Botanical Priority Protection Area
- Altamont

Significant Substrates
- Alkaline Soils Extant
- Alkaline Soils Extirpated

Public Land and Conservation Easements
Access
- Open Access
- Restricted Access
- No Access

East Bay Chapter
California Native Plant Society

1:57,600
0 2,400 4,800
Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council. Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Alameda County, California

A Sense of Place

Guest Author
Elizabeth Zacharias

Amidst the largest concentration of wind turbines in the world lies the Altamont Pass BPPA. The Altamont Pass is regionally important as a meeting place of three subregions of the California Floristic Province: the San Joaquin Valley, San Francisco Bay Area, and South Coast Range.

Within this landscape, alkaline natural communities such as Northern Claypan Vernal Pools and Valley Sink Scrub can be observed. These areas are unique natural communities and are extreme habitats. Plants that live here can survive the harsh alkaline conditions that are sometimes expressed as alkaline scalds, which are characterized by a salty crust that forms on the soil surface.

"flourish in the hot dry temperatures"

The appeal of the Altamont Pass is drawn from its mesmerizing landscape with its rolling hill topography that is strikingly golden in the late summer. This time of year is especially intriguing because it is when the *Atriplex* species that inhabit these alkaline refugia thrive and are most readily identifiable. In the fall, late season plants, namely the tarweeds and alkaline-loving plants, flourish in the hot dry temperatures and alkaline lowlands that by this time have produced their radiantly white salt deposits. The spring is also alluring as these dry hills gain a greenish hue as the annual grasses and herbs begin to germinate, grow, and explode into color when in flower.

Historically, Native Americans and gold prospectors used the Altamont Pass as a trade route or thoroughfare to the Sierran gold country. In 1853, the transcontinental railroad was built through the pass. In 1915, the Lincoln Highway was routed through the pass and later became the Altamont Pass Highway in 1938. From that time development within the pass was relatively static until wind farms began to populate the area in 1981.



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Botanical Hot Spots

Located at the edge of the Inner South Coast Range and the San Joaquin Valley, the Altamont Pass BPPA is an important transition zone between the Great Central and Livermore valleys in Alameda County. In the valley bottoms where alkaline soils are present, Valley Sink Scrub, dominated by iodine bush (*Allenrolfea occidentalis*), also supports a valuable suite of herbaceous *Atriplex* species. Local rarity abounds as records of unusual and significant plant species have been recorded from Mountain House and Patterson Pass in alkaline valley bottoms and in the heavy clay soils occupying upland slopes. A voucher of white blue-eyed Mary (*Collinsia bartsiifolia* ssp. *bartsiifolia*) has not been collected from this area since the 1930s when R.F. Hoover and Lewis Rose independently passed through here.

Sensitive Natural Community

Valley Sink Scrub (1)

Rare and Unusual Plant Species

Brittlescale - *Atriplex depressa* (2)

Saltscale - *Atriplex serenana* var. *serenana* (3)

California filaree - *California macrophylla* (4)

San Joaquin silverpuffs - *Microseris campestris* (5)

Historic Occurrence

White blue-eyed Mary - *Collinsia bartsiifolia* ssp. *bartsiifolia* (1933)

Threats, Opportunities and Constraints

For botanists, the Altamont Pass serves as the transition zone between the "Bay Area" and the "Great Valley". The annual grasslands, dotted with thousands of windmills, seem to stretch from Brentwood to Corral Hollow. This is one of California's most productive areas for wind power generation due to the swift winds that are drawn from the coast over the golden hills by the convective San Joaquin Valley furnace. Many studies have been performed on avian species and their interactions with this renewable resource area, however, little seems to be known about its botany. In between the summits of the rolling hills, alkaline swales preserve habitat for rare and unusual species. Although we don't expect this area to be developed anytime in the near future, expanding the wind farms and adding solar projects could destroy this habitat. Currently, a number of agencies have begun developing a "Wind Resources Area" Habitat Conservation Plan that will allow wind power to continue with some technological overhauls of defunct windmills. Additionally, this area also falls under the Eastern Alameda County Conservation Strategy, thus making it a site where mitigation needs could be satisfied. Given the significance of the Altamont Pass to a diversity of organisms, including plants, birds of prey, and other migratory animals and its ecological service as an important ecotone, protecting this BPPA is extremely important.

Botanical Priority Protection Area	
Byron	
Size	20,829 Acres
Watershed Information	
Watershed Based	YES - Partial
Watersheds	Brush Lower Kellogg Bethany Reservoir Delta
Significant Substrates	
Total Alkaline Soils	4,928 Acres
Alkaline Soils Extirpated	21%
Alkaline Soils Extant	79%
Total Sandy Soils	631 Acres
Sandy Soils Extirpated	2%
Sandy Soils Extant	98%
Botanical Attributes	
Locally Rare Plant Occurrences	38
CNDDB Plant Occurrences	24
State or Federally Listed Plant Populations	6
CNDDB Community Occurrences	0



Legend

Botanical Priority Protection Area
- Byron

Significant Substrates
- Alkaline Soils Extant
- Alkaline Soils Extirpated
- Sandy Soils Extant
- Sandy Soils Extirpated

Public Land and Conservation Easements

Access
- Open Access
- Restricted Access
- No Access

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California Native Plant Society

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Feet

Byron

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Contra Costa County, California

A Sense of Place

Guest Author
Mike Wood

The Byron BPPA is a botanically diverse, habitat rich area unlike any you will encounter in the immediate Bay Area. The alkali-influenced habitats are reminiscent of the southern San Joaquin Valley and support an exciting assemblage of annual and perennial plant species not found elsewhere in our chapter area. It is part of a generally uninterrupted stretch of open space between the Central Valley, the Altamont Hills and Mount Diablo. Some of the plant communities it supports are rare in the region and harbor rare plant and animal species. Nearly all of the alkali wetlands within the East Contra Costa Habitat Conservation Plan inventory area are found in the Byron area.

Viewed from afar, this landscape is captivating with its undulating slopes, ravines, flat lands, and the interplay of grassland and sky. Up close, one begins to appreciate the botanical treasures that reside here, especially in the alkali "scalds" or the claypan vernal pools. Whether due to changes in chemical composition, soil structure, or hydrologic regime, these areas serve as an ecological filter and refuge to an assortment of plant species by resisting invasion of non-indigenous plant species not adapted to these local conditions. In the scalds, it is remarkable to see several rare members of the genus *Atriplex* persisting in these otherwise barren, sandy, inhospitable patches in a sea of Italian ryegrass. The vernal pools not only provide haven for narrowly distributed plant species but also display flowery concentric patterns of color as the pools gradually dry in spring.

"haven for narrowly distributed plant species"

EAST BAY CNPS



Botanical Hot Spots

The Byron BPPA has the largest intact expanses of alkaline habitat in Contra Costa County. It is likely here where caper-fruited tropidocarpum (*Tropidocarpum capparideum*) was first described as inhabiting alkaline valley lands along the San Joaquin River. The last collection of this species, vouchered in 1957, is from a field near Holey Road. Areas flanking Byron Highway and Byron Airport are sublime examples of Alkaline Meadow habitat in eastern Contra Costa County. A springtime acquaintance can be made with recurved larkspur (*Delphinium recurvatum*) which can be found in these areas. A diminutive yet pungent member of the lily family, stinkbells (*Fritillaria agrestis*), watches over hill slopes of clay lenses along the Vasco and Camino Diablo corridors. Although private and subject to mining activity, a broad band of sand, totaling a few hundred acres, is also present within this BPPA. The Bay Area's botanical great grandmother, Alice Eastwood, passed through the Byron Hot Springs area on a collecting trip in 1914 where she collected ladiestongue mustard (*Heterodraba unilateralis*). Like Ms. Eastwood, this species is now but a wonderful memory.

Sensitive Natural Community

Alkali Meadow (1)

Rare and Unusual Plant Species

San Joaquin spearscale - *Atriplex joaquinana*

Recurved larkspur - *Delphinium recurvatum* (2)

Stinkbells - *Fritillaria agrestis* (3)

Caper-fruited tropidocarpum - *Tropidocarpum capparideum* (4)

Historic Occurrence

Ladiestongue mustard - *Heterodraba unilateralis* (1914) (5)

Threats, Opportunities and Constraints

Byron is an oft overlooked area that sits in the lowlands between Altamont Pass and the familiar prominence of Mount Diablo. It has long attracted travelers and was once known as a booming resort town where tourists and locals alike would soak in the alkaline waters provided by the warm springs at the historic Byron Hot Springs Resort. As business slowed, the infrastructure deteriorated and the community gradually dissolved. Surveyed by many of the early California botanists, this area has records of six plant species that haven't been observed in over 30 years. Although the landscape may be considered prime real estate by some developers - it is flat, relatively inexpensive, and somewhat unattractive to the untrained eye - Byron has thus far undergone little development pressure. Yet, at regular intervals, proposals to redevelop the hot springs or build low-density subdivisions do occur and such proposals would only further marginalize the ecology of this botanically significant area. Given the particular combination of soils, climate, groundwater, and drainage that help maintain its unique flora, this area must be preserved in its entirety. The Byron area, like several other BPPAs, occurs within the scope of the East Contra Costa County Habitat Conservation Plan, so there may be opportunities to preserve its unique habitat types.

Botanical Priority Protection Area	
Cedar Mountain	
Size	26,570 Acres
Watershed Information	
Watershed Based	YES
Watersheds	Tunnel Lang Canyon Upper Arroyo Mocho
Significant Substrates	
Total Serpentinite	7,928 Acres
Serpentinite Extirpated	0%
Serpentinite Extant	100%
Botanical Attributes	
Locally Rare Plant Occurrences	150
CNDDB Plant Occurrences	16
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	0

Carnegie State Vehicular Recreation Area

Del Valle Regional Park

Ohlone Regional Wilderness

Mines Road

San Joaquin

Stanislaus

Santa Clara



Legend

Botanical Priority Protection Area
- Cedar Mountain

Significant Substrates
- Serpentine Bedrock and Soils

Public Land and Conservation Easements

Access
- Open Access
- Restricted Access
- No Access

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Feet

Cedar Mountain

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Alameda County, California

A Sense of Place

Guest Authors
John Game, Steve Edwards

Cedar Mountain, in arid southeastern Alameda County, preserves a most unusual habitat. The mountain is topped by a verdant Sargent Cypress forest, dark green in color, seeming almost marooned in a region of chaparral and oak woodland, and beneath the cypresses there are vast, luxuriant stands of native perennial grasses, especially the large, fountain-like tussocks of California Fescue. Although the mountain is remote and difficult to reach, a journey there is especially worthwhile because the habitat differs dramatically from any other in the East Bay.

"a most unusual habitat"

In addition to the cypress forest, the mountain includes raw serpentine barrens, and these settings as well as others on or adjacent to the mountain support many rare or unusual species. There are at least three kinds of jewelflowers (*Streptanthus* spp.) and two of them may need new names. The beautiful Talus Fritillary (*Fritillaria falcata*) has its northernmost occurrence here. Among the other notable rare plants are Carlotta Hall's lace fern (*Aspidotis carlotta-halliae*), Jepson's woolly sunflower (*Eriophyllum jepsonii*), fairy fans (*Clarkia breweri*), and long-rayed brodiaea (*Triteleia peduncularis*). The serpentine body is the largest montane block of this lithology in the East Bay and, owing to its remoteness, it has been but little explored.

Serpentine substrate and remoteness may account for the fact that the vegetation on Cedar Mountain is unusually pristine—it has been little intruded by invasive exotic species. To stand among the cypresses in this unique, high-quality habitat and gaze northward to Mount Diablo or eastward to the San Joaquin Valley constitutes one of the most thrilling natural history experiences in the Bay Area, and Cedar Mountain has long been at the top of the list of the most important places needing protection in the East Bay.



EAST BAY
CNPS











Botanical Hot Spots

Serpentine substrates are the basis for the true character of the Cedar Mountain BPPA. This ultramafic mountain is the only place in the East Bay where magnificent Sargent cypress (*Hesperocyparis sargentii*) forests occur. These stands act as mountain sentinels guarding a multitude of serpentine-loving plant species. A resident wild onion of the Mount Hamilton range, Sharsmith's onion (*Allium sharsmithiae*), was named for a native daughter of the East Bay, Helen Sharsmith. Ms. Sharsmith added to the California flora by writing the Flora of the Mount Hamilton Range for her dissertation in 1945 based on her extensive field work. Other species known from this BPPA include local rarities such as Brewer's jewelflower (*Streptanthus breweri* var. *breweri*) and spring gold (*Crocidium multicaule*). Ira Wiggins was the last person to collect Siskiyou false rue anemone (*Enemion stipitatum*) from Cedar Mountain in 1926.

Sensitive Natural Community

Northern Interior Cypress Forest (1)

Rare and Unusual Plant Species

Sharsmith's onion - *Allium sharsmithiae*

Plain mariposa - *Calochortus invenustus* (2)

Mt. Hamilton thistle - *Cirsium fontinale* var. *campylon* (3)

Spring gold - *Crocidium multicaule*

Talus fritillary - *Fritillaria falcata* (4)

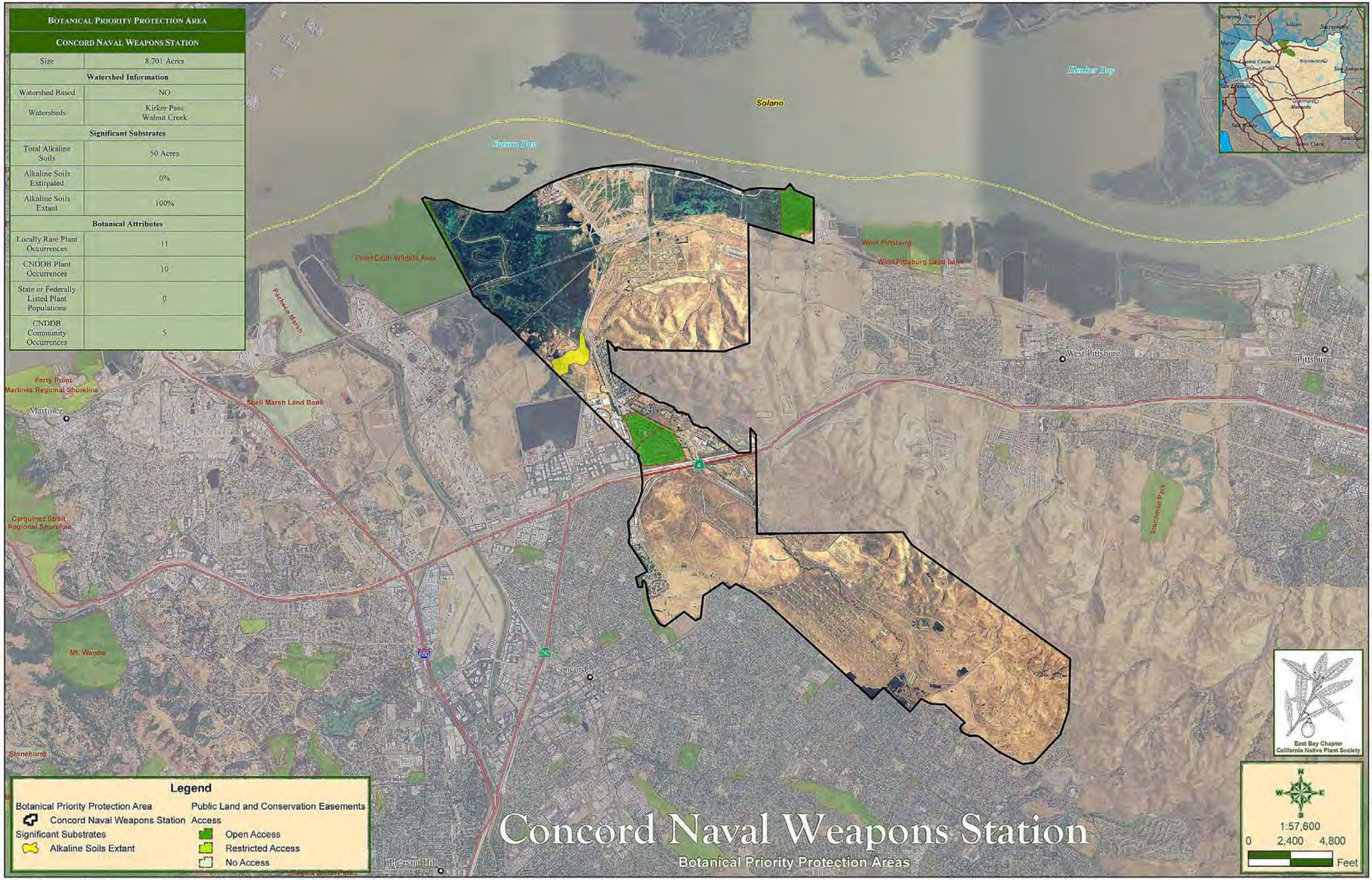
Historic Occurrence

Pine forest larkspur - *Delphinium gracilentum* (1926) (5)

Threats, Opportunities and Constraints

Tucked into the southeastern corner of Alameda County, Cedar Mountain is one of the many rarely frequented gems of the Hamilton range. This rugged landscape has been explored by few since nearly all of the land is privately owned. Once, this land crawled with miners, imparting the familiar moniker of "Mines" to the road which runs through this area. The serpentine bedrock and soils are a well mapped feature of this rugged country, indicating that a high level of botanical diversity and endemism exists within these edaphic plant communities. There are no immediate threats by development or industry to the landscape, but a revival in mining of rock or rare earth elements could be enormously destructive to the delicate botanical resources here. The Nature Conservancy has outlined Cedar Mountain in its Central Coast Ecoregional Plan as an area of high conservation priority, and to date, the Conservancy has helped protect lands and empower private landowners to manage their lands with more ecological savvy than any other organization in this area. Additionally, Cedar Mountain is within the scope of the Eastern Alameda Conservation Strategy as a potential conservation area.

Currently, very little of the land is accessible to the public for recreation or research. Many partnership opportunities exist to help educate landowners, as well as to help privately protect some of the best hidden natural resource treasures in the East Bay.



Botanical Priority Protection Area	
Concord Naval Weapons Station	
Size	8,701 Acres
Watershed Information	
Watershed Based	NO
Watersheds	Kirker Pass Walnut Creek
Significant Substrates	
Total Alkaline Soils	50 Acres
Alkaline Soils Extirpated	0%
Alkaline Soils Extant	100%
Botanical Attributes	
Locally Rare Plant Occurrences	11
CNDDB Plant Occurrences	10
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	5

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council. Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Concord, Contra Costa County, California

A Sense of Place

Guest Author
Dianne Lake

Once a bustling military installation, the Concord Naval Weapons Station is now a place of stunning silence. The variety of water features, from baylands to foothills, provide potential habitat for a number of rare plants. Notably, Mount Diablo creek runs in daylight after emerging from an upstream portion that is channelized and buried. This creek has extensive riparian vegetation until it meets the extent of the brackish bay water, where the vegetation shirks in stature. These salt marsh habitats are home to soft bird's-beak which is limited to only a few occurrences with specific soil and hydrological conditions. This short annual has an extremely humble flower that is barely noticeable to the untrained eye. Additional state-listed salt marsh plants that are found here includeSuisun marsh aster, Delta tule pea, and Mason's lilaeopsis.

"a place of stunning silence"

The tule pond, or cistern pond, rings out with song in the evenings. This pond provides year-round water and habitat to many plants and animals. Freshwater wetland plants thrive here, including a host of sedges and rushes. The least surveyed habitat on this site may be the vernal pools and swales that dot the landscape. These features are spread throughout the site and provide potential habitat for some of the most fleeting of our East Bay plants.

The drier upland areas also have some interesting flora. The grove of valley oaks in the Southern end of the site add woodland character to this landscape. When the soil gets even thinner, barren and rocky areas can be found with blazing stars, that are found few other places in the East Bay.

This is truly a place of great mystery. Its position in the landscape seems to hint at this area being an extension of Lime Ridge, where a number of rare Pincushion plants and Eriastrums are found. Very few historical plant collections are attributed to this area. Even the well-traveled Brewer did not grace this area with his presence. No one knows why, but it's certain that there are many undiscovered mysteries about this landscape.



EAST BAY
CNPS











Botanical Hot Spots

Located at the western end of the Los Medanos Hills and along the southern shore of Suisun Bay, Concord Naval Weapons Station BPPA is less known for its botanical residents than for its military history. Nonetheless, it boasts Northern Coastal Salt Marsh and some rare plant species. Along the waterfront is one of the most easterly occurrences of the federally Endangered soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*). Two species endemic to the Sacramento-San Joaquin Delta region also inhabit these shores, Delta tule pea (*Lathyrus jepsonii* ssp. *jepsonii*) and Mason's lilaeopsis (*Lilaeopsis masonii*). These bear the names of two of California's more notable botanists. A third botanist, Robert F. Hoover, was a prodigious collector in the East Bay during the 1930s. Hoover was the last person to collect snake's head (*Malacothrix coulteri*) in this area in 1935. This collection represents the northernmost station for this Mojavian species.

Sensitive Natural Community

Northern Coastal Salt Marsh (1)

Rare and Unusual Plant Species

Suisun marsh aster - *Symphyotrichum lentum* (2)

Soft bird's-beak - *Cordylanthus mollis* ssp. *mollis* (3)

Delta tule pea - *Lathyrus jepsonii* var. *jepsonii* (4)

Mason's lilaeopsis - *Lilaeopsis masonii*

Historic Occurrence

Snake's head - *Malacothrix coulteri* (1935) (5)

Threats, Opportunities and Constraints

The Concord Naval Weapons Station is undergoing a public process to plan and reuse the majority of the inland portion of the base. The coastal portion will remain military land while the public helps decide what to do with some 5,000 acres of grasslands, oak savanna, streams, and vernal pools. While this process has been heavily monitored by the environmental and affordable housing groups, final decisions are made by a group of five City Council members who will select and approve the final plans. With great persistence and passion, the local community and City Council recently denied a "take-over" proposal by a developer that would have unilaterally given the property to that developer. Although much of the land has been impacted from the conversion of the natural landscape to a munitions depot, the inland and coastal portions provide the most intact corridor from the Suisun Bay up into the rocky pinnacles of Mount Diablo. Only recently have focused botanical surveys started to uncover some of the more cryptic inhabitants of the inland portion of this base. We believe that proper management and stewardship of this area will unveil even more botanical surprises. With the help of the community, environmental organizations, and the Concord City Council, much of this land will become the area's newest regional park, to be managed by the East Bay Regional Park District.

Botanical Priority Protection Area	
Corral Hollow	
Size	8,974 Acres
Watershed Information	
Watershed Based	YES - Partial
Watersheds	Patterson Run Arroyo Seco Mitchell Ravine
Significant Substrates	
Not Applicable	
Botanical Attributes	
Locally Rare Plant Occurrences	64
CNDDB Plant Occurrences	8
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	0

Millard Hughes
Silva/Clamp Ranch
BLM
Corbett Greenville Ranch
Del Valle Regional Park
Tesla
Carnegie State Vehicular Recreation Area
San Joaquin



East Bay Chapter
California Native Plant Society

Legend

Botanical Priority Protection Area
Corral Hollow

Public Land and Conservation Easements
Access
Open Access
Restricted Access
No Access

1:48,000
0 2,000 4,000
Feet

Corral Hollow

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Alameda County, California

A Sense of Place

Guest Author
Erin McDermott

Approaching from the west, one leaves south Livermore passing by vineyards that boarder Tesla Road. Once east of Greenville Road the cultivated route fades away as you are drawn toward the hills that embody days of old California. This is the Corral Hollow BPPA and it is wild. Corral Hollow is near the northern end of the South Coast Range. Regionally this area is part of the Diablo Range Corridor that connects Mount Diablo, in the north, to the Mount Hamilton Range, in the west, and Cedar Mountain, to the south. Corral Hollow also provides an east-west corridor between the San Joaquin and Livermore valleys.

"lush riparian valleys"

This "Hollow" is a dry, rocky, and steep place covered with brush, oaks, and scattered pines and rock outcrops. The rolling grassy hills offer sweeps of wildflowers in the spring while accents of lush riparian valleys filled with sycamores and cottonwoods provide shaded respites in the hot summer months. Looking upward you might encounter a soaring hawk or golden eagle.

Late spring brings dry parched hills with wilting temperatures but does provide opportunity to find secret gems like scrub sentinel Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*) poking its towering inflorescences out of the top of the sagebrush; the armored yet delicate Santa Clara thorn-mint (*Acanthomintha lanceolata*) in flower on hot dry, steep, loose, talus slopes; and stands of flowering purple needlegrass (*Nassella pulchra*) with their twisted awns waving in the wind.

In the not-so-distant past Native Americans inhabited the valley, and bedrock mortars are a gentle reminder of their presence here. Corral Hollow contained the hamlet of Tesla and its associated coal mine, which supplied most of the coal used in the Bay Area from 1902 to 1915, according to Steve Edwards, author of the Bay Nature article "Vale of Tesla". At one point the town had as many as 1,500 residents.

EAST BAY
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Botanical Hot Spots

Looking at a stand of Desert Olive Scrub, one could imagine oneself in some Mojave canyon while standing firmly in an East Bay county, so closely does the feeling of being in Corral Hollow resemble a desert experience. Indeed there is an abundance of other plant species such as desert shredding primrose (*Camissonia boothii* ssp. *decorticans*) that have crept up the west side of the San Joaquin Valley from the Mojave Desert. There are also significant South Coast Range stalwarts, including big tarplant (*Blepharizonia plumosa*). Corral Hollow is a stronghold of this tall annual which secretes fragrant terpenoids that can act as an olfactory alarm to let you know it is close by. Robert F. Hoover came through Corral Hollow with his plant press in 1938 when he collected green fiddleneck (*Amsinckia vernicosa* var. *vernicosa*) in 1937. He was the last one to do so.

Sensitive Natural Community

Desert Olive Scrub (1)

Rare and Unusual Plant Species

Big tarplant - *Blepharizonia plumosa* (2)

Desert shredding primrose - *Camissonia boothii* ssp. *decorticans* (3)

Lemmon's jewelflower - *Caulanthus coulteri* var. *lemmonii* (4)

Rayless ragwort - *Senecio aphanactis*

Historic Occurrence

Green fiddleneck - *Amsinckia vernicosa* var. *vernicosa*

Threats, Opportunities and Constraints

The arid canyon known as Corral Hollow runs from the Mediterranean Bay Area onto the edge of the San Joaquin Valley. This area has a long cultural history of use by Native Americans, miners and gold rushers alike. Home to many desert species of plants and animals, this area is at an ecological crossroads. The Corral Hollow area is most frequently observed through a windshield or the occasional turn-out on Tesla Road. Otherwise, this alluring area is largely restricted from public access other than what Carnegie State Park provides. The remainder of the land within this BPPA is held by private hands or the Lawrence Livermore National Laboratory. Extremely limited access can be both a benefit and a bane. Few botanical surveys have been completed in this area and its doubtful many area residents are familiar with the place-name "Corral Hollow". The most notable and germane threat to this area is the expansion of the existing California State Parks Off Highway Vehicle area known as "Carnegie State Park". Since this is one of the few publicly owned lands in this area, the thirst for this type of recreation needs to be balanced with real conservation. Carnegie's hills are steep, often glowing green in the spring but scarred from the hill climbing events of the summer. Although some land that expanded the Carnegie holdings was purchased by OHV funds, we believe that there may be other areas which could be sacrificed for off road vehicles that are less botanically significant. Discussions with State Parks have been ongoing for over 5 years with hope for other expansion alternatives.

Botanical Priority Protection Area	
Delta	
Size	63,631 Acres
Watershed Information	
Watershed Based	NO
Watersheds	Delta
Significant Substrates	
Total Alkaline Soils	3,639 Acres
Alkaline Soils Extirpated	49%
Alkaline Soils Extant	51%
Total Sandy Soils	14,077 Acres
Sandy Soils Extirpated	53%
Sandy Soils Extant	47%
Botanical Attributes	
Locally Rare Plant Occurrences	49
CNDDB Plant Occurrences	105
State or Federally Listed Plant Populations	3
CNDDB Community Occurrences	45



Legend

Botanical Priority Protection Area
- Delta

Significant Substrates
- Alkaline Soils Extant
- Alkaline Soils Extirpated
- Sandy Soils Extant
- Sandy Soils Extirpated

Public Land and Conservation Easements

Access
- Open Access
- Restricted Access
- No Access

East Bay Chapter
California Native Plant Society

1:95,040
0 0.75 1.5
Miles

Delta

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Eastern Contra Costa County, California

A Sense of Place

Guest Author
Chris Thayer

At the confluence of the great San Joaquin and Sacramento river systems, the California Delta of Contra Costa County is at the center of connectivity between the state's freshwater and terrestrial resources. Along its meandering estuarine sloughs, rare shoreline plants such as woolly rose-mallow, Suisun Marsh aster, and Delta tule pea find their homes. Nearby, remnant dunes formed by wind-blown sands of the late Pleistocene and early Holocene periods harbor a handful of local plant rarities, including several desert denizens that became stranded along the west side of the San Joaquin Valley far from home in the Mojave following the Hypsithermal Period of global warming some 6,000 to 8,000 years ago. Species such as California croton, desert primrose, and valley lessingia are found nowhere else in our region but on the local relict dunes. The exceedingly narrow ranges of the Contra Costa wallflower and the Antioch Dunes evening primrose are now essentially confined to the Antioch Dunes National Wildlife Preserve. Lange's metalmark butterfly, dependent on the unique Antioch Dune buckwheat is also restricted to the preserve. This precarious location is one of the last outstanding examples of the Delta dune habitat, historically diminished by extensive sand mining and industrialization in the past century. Alkaline and saline soil deposits, once widespread in the Delta region, have also dwindled in our lifetime, along with the specialized habitats for another suite of rare and unusual species, owing in part to the construction of a system of levees in the early 1900s that disconnected the land from tidally-influenced waters and natural river flow. Freshwater diversion, for both domestic water supply and agricultural use, has contributed to salt intrusion into waters of the Delta. Other human impacts, including the introduction of non-native wildlife and plants, have been greatly detrimental to the natural processes of the region. The recent urbanization of the greater Delta may have been poorly planned, considering the region's strategic position for water supply in California as well as the potential for restoration of fisheries habitat, crucial to our state's welfare if we take history into consideration. Efforts currently underway to restore components of this important Bay Area landscape are worthy of our support.

"the center of connectivity"



EAST BAY
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Botanical Hot Spots

In the far northeastern corner of Contra Costa County lies the Delta BPPA. Sand and salts are the principal factors that provide for intriguing plant communities here. Most notable are the Stabilized Interior Dunes. What was maybe once more widespread on these sand hills near the San Joaquin River, but now relegated to very few occurrences is the federally Endangered Antioch Dunes evening primrose (*Oenothera deltoides* ssp. *howellii*). Two local rarities of the sunflower family that can be found on these dunes, though fast disappearing, are sticky lessingia (*Lessingia glandulifera* var. *glandulifera*) and Lobb's tarweed (*Deinandra lobbii*). In this BPPA, one of two East Bay locations for boraxweed (*Nitrophila occidentalis*) occupies an alkaline flat just east of the Contra Costa Canal near Oakley. Herbert L. Mason came through this area in 1932 on a collecting trip. It was then that Douglas' phacelia (*Phacelia douglasii*), a South Coast Range regular, was collected for the last time in this county.

Sensitive Natural Community

Stabilized Interior Dunes (1)

Rare and Unusual Plant Species

California croton - *Croton californicus* (2)

Lobb's tarweed - *Deinandra lobbii*

Boraxweed - *Nitrophila occidentalis* (3)

Antioch Dunes evening primrose - *Oenothera deltoides* ssp. *howellii* (4)

Historic Occurrence

Douglas' phacelia - *Phacelia douglasii* (1932) (5)

Threats, Opportunities and Constraints

The Antioch Dunes may be the single most imperiled landscape in the East Bay. Standing at the edge of the Delta, these inland dunes once towered some 120 feet over water's edge. These behemoths served as refuge for native peoples as well as desert plants and animals that are now nearly extinct from this area. Once the value of building materials skyrocketed after San Francisco's 1906 earthquake, the dunes became a resource for rebuilding the city. More recent development projects continued to harvest sands and flatten the dunes, in many cases down to the underlying hardpan. Luckily, some impacted properties adjacent to the larger preserve may still harbor suitable habitat for endangered species. The conservation of these sites would allow for a large preserve to emerge to help manage these unique resources on a landscape scale.

The fast growing native annual herbs and deep rooted perennials of the Antioch Dunes are adapted to the nature of the constantly blowing sands. This constant movement of the sand acts as an equalizer, impeding more competitive invaders from getting established in this unstable milieu. However, as human disturbance increased, more weeds have been introduced, thus stabilizing the sand dunes. Extensive annual grasses and nitrogen-fixing plants have colonized this area and have dramatically altered both the vegetation and functionality of these dunes. Recent changes in policy have allowed for experimental management of the dunes that will attempt to shift the balance back to the native plants. Antioch Dunes National Refuge has the honorable distinction of being the first US Fish and Wildlife National Refuge created for the protection of insects and plants.

Botanical Priority Protection Area	
East Dublin & Tassajara	
Size	15,419 Acres
Watershed Information	
Watershed Based	YES
Watersheds	Lower Tassajara Cottonwood
Significant Substrates	
Total Alkaline Soils	573 Acres
Alkaline Soils Extirpated	1%
Alkaline Soils Extant	99%
Botanical Attributes	
Locally Rare Plant Occurrences	2
CNDDB Plant Occurrences	94
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	0



Los Vaqueros Watershed

Los Vaqueros Reservoir

Brushy Peak

Brushy Peak Regional Preserve

Highland Road

Tassajara Valley

Tassajara Creek Regional Park

Dublin Canyon

Bishop Ranch Regional Open Space

Dougherty Hills Open Space

Machado Property

Dublin Hills

Dublin Hills

Dublin

580

580

Las Positas Golf Course

Garaventa Wetlands Preserve

Springtown Preserve

Livermore

Legend

Botanical Priority Protection Area
East Dublin & Tassajara

Significant Substrates
Alkaline Soils Extant
Alkaline Soils Extirpated

Public Land and Conservation Easements
Access
Open Access
Restricted Access
No Access

East Dublin & Tassajara

Botanical Priority Protection Areas

East Bay Chapter
California Native Plant Society

1:57,600
0 2,400 4,800
Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Alameda and Contra Costa Counties, California

A Sense of Place

Guest Author
Bruce Baldwin

For me, the look and smell of the East Dublin-Tassajara area resonates as a connection with my childhood in Arroyo Grande and a lifetime of California experiences. It is as close to pristine California as you can get in our East Bay grasslands. Based on studies conducted at the Jepson Herbarium, I can attest that this area is home to some plants, such as Congdon's tarplant, undergoing initial evolutionary divergence in our area and some that represent much more ancient diversity than previously thought, such as the San Joaquin spearscale. This diversity probably owes much to the dynamic geological history and steep ecological gradients provided by this BPPA. With continued urbanization, there is potential to lose diversity within these refugia prior to its discovery or full characterization.

"some plants undergoing initial evolutionary divergence"

The alkaline habitat that supports species such as Congdon's tarplant and San Joaquin spearscale is botanically rich and rare within the Bay Area. However, habitat such as this is typically considered wasteland. The plants that occupy this alkaline habitat may not have horticultural appeal either, although they have enormous value to biologists and their importance to understanding California's natural history is great. Once the observer realizes the value of this underappreciated biological diversity, its unique beauty can shine through.

Even in the fall season when the place superficially looks spent and desiccated, there is a lot going on, not only with the plants but also with the insects, whose associations and interactions are poorly understood. Visiting here in the morning and evening hours will allow you to beat the heat and observe more wildlife activity. I especially enjoy the feeling of this country at the time of day when the lighting is dim and the shadows are long.



EAST BAY
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East Dublin & Tassajara



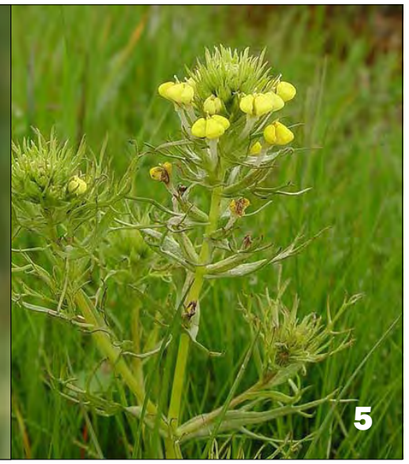
1



2



3



4

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Botanical Hot Spots

The alkaline valley bottoms within Tassajara Creek, Highland Road, and Doolan Canyon are also the heartland for another unique member of the sunflower family, Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*). This summer flowering species was named after Joseph Whipple Congdon, a Rhode Island transplant who made innumerable contributions to the California flora. Another extremely important component of this BPPA is the remnant Northern Claypan Vernal Pools that have almost completely disappeared along the Interstate 580 corridor. Of the crown jewels that have been known to occupy these botanical refugia are species such as saline clover (*Trifolium depauperatum* var. *hydrophilum*), white headed navarretia (*Navarretia leucocephala* var. *leucocephala*), and annual semaphoregrass (*Pleuropogon californicus* var. *californicus*). However, the eastward march of the City of Dublin continues to threaten these imperiled East Bay habitats.

Sensitive Natural Community

Northern Claypan Vernal Pool (1)

Rare and Unusual Plant Species

Congdon's tarplant - *Centromadia parryi* ssp. *congdonii* (2)

White-headed navarretia - *Navarretia leucocephala* var. *leucocephala* (3)

Semaphore grass - *Pleuropogon californicus* var. *californicus*

Saline clover - *Trifolium depauperatum* var. *hydrophilum* (4)

Yellow owl's clover - *Triphysaria versicolor* var. *faucibarbata* (5)

Threats, Opportunities and Constraints

At the edge of the suburban sprawl sits a warm farming community that was once surrounded by voluptuous hills and low elevation wilderness. Now it seems that the ecological heritage of the Tassajara Valley and its surrounding hills is under assault by pseudo-agrarian projects like "New Farm" and by Dublin's insatiable desire to expand its Dougherty Valley-like projects even further east. Some of the most exemplary vernal pools of the East Bay have already been consumed by recent development and are now a memory under high rises that tower over Interstate 580. Many of these sites are now home to "landscaped parks" with horticultural trees displacing one of the most species-rich grassland areas in the East Bay. A few years back, an entire town was planned for the center of Tassajara Valley, only to be stopped by a coalition of groups interested in protecting its natural resources. This BPPA is practically devoid of woody shrubs and trees, instead this landscape is dominated by one of the last remaining matrices of grasslands and vernal pools that once characterized the greater Livermore Valley. The Eastern Alameda County Conservation Strategy and Tri-Valley Conservancy's North Livermore conservation plan may bring more attention from biologists and planners to this area, we hope with an eye on preserving the dry land farming and ranching life that once flourished in the Livermore Valley.

Botanical Priority Protection Area	
Four Valleys	
Size	13,052 Acres
Watershed Information	
Watershed Based	YES
Watersheds	Sand Deer
Significant Substrates	
Total Alkaline Soils	632 Acres
Alkaline Soils Extirpated	17%
Alkaline Soils Extant	83%
Total Sandy Soils	1,916 Acres
Sandy Soils Extirpated	27%
Sandy Soils Extant	73%
Botanical Attributes	
Locally Rare Plant Occurrences	13
CNDDB Plant Occurrences	15
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	0

Oakley

Contra Loma Regional Park

Easement

Black Diamond Mines Regional Preserve

Black Diamond Mines Regional Preserve

Lone Tree Valley

Horse Valley

Black Diamond Mines

Roddy Ranch Agricultural Preserve

Deer Valley

Roddy Ranch

Chaparral Springs

Clayton Ranch Land Bank

Game Refuge 3-F

Mount Diablo State Park

Briones Valley

John Marsh Home/Cowell Ranch State Historic Park

Wright Property

Seeno Conservation Easement

Galvin

Round Valley Regional Park

Los Vaqueros Watershed

Legend

Botanical Priority Protection Area
- Four Valleys

Significant Substrates
- Alkaline Soils Extant
- Alkaline Soils Extirpated
- Sandy Soils Extant
- Sandy Soils Extirpated

Public Land and Conservation Easements

Access
- Open Access
- Restricted Access
- No Access

Four Valleys

Botanical Priority Protection Areas

East Bay Chapter
California Native Plant Society

1:57,600
0 2,400 4,800
Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council. Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Antioch, Contra Costa County, California

A Sense of Place

Guest Author
David Gowen

The historic names of these four valleys convey a sense of a slower pace of life and an emphasis on living in nature. Lone Tree, Sand Creek, Horse, and Deer Valleys are four grassland-rich drainages that flow from the uplands of Black Diamond Mine area, emptying into the flatlands of Brentwood. The four valleys area has been grazed since the 1800s, even before Marsh's first settlement in this area. Our human influence on this landscape is evident, but only recently have researchers began to understand how grazing promotes the conservation of rare plants in this area. Even now, new occurrences of known plants are being found in this ecotone between the Central Valley and Coast Ranges. The large expanses of grasslands take on a brilliant, warm light in the mornings. This area might be best described in spring as green hills, with a sense of quiet. The prevailing winds are westerly so that the urban noise to the north rarely finds its way into the valleys. Although close to large cities, the four valleys are private and relaxing, and represent some of the last "flat lands" that haven't been developed in the East Bay.

"green hills, with a sense of quiet"

These grasslands are home to the first location where big tarplant was collected, and where it continues to thrive. Vernal swales often wind in the valley bottoms providing habitat for halophiles or other salt loving plants. Round-leaved filaree, once thought to be ubiquitous in the East Bay, can still be found here. Patches of Diablan Sage Scrub, Blue Oak Woodland, and occasional valley oaks retain some of the most interesting species found in the East Bay. Here we find an odd occurrence of Hansen's larkspur, otherwise distributed in the Southern Sierra Nevada Range. Two unusual pincushion plants (*Navarretia ssp.*) are found in this area including the southern-most occurrence of Tehama pincushion, which is otherwise found in the North Coast Range. Time has stood still in this ranching landscape and community, until recently.

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Botanical Hot Spots

Near the boundary of the Great Valley and San Francisco Bay subregions of the California Floristic Province lies the Four Valleys BPPA. These valleys include Briones, Deer, Horse, and Lone Tree valleys. They create a transition zone between the eastern flanks of the northern Diablo Range, the San Joaquin Valley, and the Los Medanos Hills where both sandy and alkaline soil hot spots produce wildflower fields with springtime riots of color. Rosinweed (*Calycadenia multiglandulosa*) has even been known to provide some late season color in this golden landscape during the month of August. Many of the historic collections of this area are attributed only to the City of Antioch since official landmarks were less abundant in the 19th century. Showy madia (*Madia radiata*) is one of these species. It was repeatedly collected from Antioch and Lone Tree Valley, the only places it has been known from in the East Bay. Robert Hoover's plant press strikes again as he was the last person to collect this species from within our chapter area in 1941.

Sensitive Natural Community

Wildflower Fields (1)

Rare and Unusual Plant Species

Rosinweed - *Calycadenia multiglandulosa*

Hansen's larkspur - *Delphinium hansenii* (2)

Showy madia - *Madia radiata* (3)

Adobe navarretia - *Navarretia nigelliformis* ssp. *nigelliformis* (4)

Historic Occurrence

Slender pentachaeta - *Pentachaeta exilis* ssp. *exilis* (1931) (5)

Threats, Opportunities and Constraints

Running in succession from north to south, the Lone Tree, Horse, Deer and Briones Valleys were once bucolic ranch lands. About a quarter of a century ago, the City of Antioch began to sprawl into the foothills of Mount Diablo. Developers saw these flat valleys as ideal places for luxury homes well distanced from urban noise. Two of the valleys have already been impacted by sprawling single family homes, wide roads, and plantations of exotic street trees. Given current plans, all four valleys will be populated with tens of thousands of people and thousands of new single-family detached homes. Strong development pressures and financing from large homebuilders helped pass Measure K in 2005 that allowed for further development into these historically rich botanical areas. Many people initially hoped that these important areas could be spared, but because the City of Antioch refused to participate in the East Contra Costa County Habitat Conservation Plan, that opportunity was lost. Proposed developments will now be under greater scrutiny by resource agencies and local public land advocates who have directed their focus towards this area, since development could mean the loss of some of the last western corridors for San Joaquin kit fox, the type-locality for big tarplant (*Blepharizonia plumosa*), and many desert taxa that have migrated this far north during long warming trends thousands of years ago. These valleys provide an important east-west migration corridor for both plants and animals. Save Mount Diablo, Friends of Marsh Creek, and two land trusts have been working hard to help bring attention to the resources of this area and help maintain viable ranching landscapes for many years to come.

Botanical Priority Protection Area	
Marsh Creek	
Size	14,921 Acres
Watershed Information	
Watershed Based	YES
Watersheds	Long Canyon Sycamore Curry Canyon
Significant Substrates	
Total Serpentinite	80 Acres
Serpentinite Extirpated	0%
Serpentinite Extant	100%
Botanical Attributes	
Locally Rare Plant Occurrences	8
CNDDB Plant Occurrences	8
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	2

Black Diamond Mines Regional Reserve
Black Diamond Mines
Roddy Ranch Agricultural Preserve
Roddy Ranch
Chaparral Springs
Clayton Ranch Land Bank
Game Refuge 3-F
North Peak
Marsh Creek
John Marsh Home/Cowell Ranch State Historic Park
Knight Property
Mount Diablo State Park
Diablo Foothills Regional Park
Seeno Conservation Easement
Galvin
Round Valley Regional Park
Oak Hill Park
City Park
Los Vaqueros Watershed
Morgan Territory Regional Preserve

Sonoma Napa Solano Sacramento Marin Contra Costa Brentwood San Joaquin San Francisco Oakland Alameda San Mateo Santa Clara Stanislaus

East Bay Chapter
California Native Plant Society

Legend

Botanical Priority Protection Area
- Marsh Creek

Significant Substrates
- Serpentine Bedrock and Soils

Public Land and Conservation Easements
Access
- Open Access
- Restricted Access
- No Access

N W E S

1:57,600

0 2,400 4,800 Feet

Marsh Creek

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Contra Costa County, California

A Sense of Place

Guest Author
Mike Park

One of the greatest attractions of the Marsh Creek BPPA is that it is significantly underbotanized as evident by the very few collections at the University and Jepson Herbaria. Marsh Creek's geomorphology creates an intriguing variety of habitats. The canyon of the upper creek is rather deep, moist, and mesic. The transitional areas and canyon walls support vegetation communities that range from open blue oak savannah to impenetrable chaparral communities. And, the ridges are either wooded or windswept rocky grasslands.

"the fragrance of black sage is delightful"

Marsh Creek offers rewarding hikes for people of all skill and fitness levels, yet the area seldom draws throngs of hikers and lends itself to quiet, thoughtful explorations. Adjacent public lands such as Morgan Territory Regional Preserve and Mount Diablo State Park can be accessed from Marsh Creek. April to May is the best time to visit. Wildflowers are peaking, and the temperatures have not yet begun to regularly reach above the mid-80s. The tranquility early in the day is the most striking feature as birds fill the air with calls and song, the air is still cool and the canyon bottoms are moist and fragrant. In chaparral, the fragrance of black sage (*Salvia mellifera*) is delightful. Midday is frequently too warm, but sunsets can often be worthwhile from the high ridges as the air cools.

Interesting plant and animal interactions have been noted here. The maintenance of open areas between chaparral and grasslands seems to be facilitated by seed-eaters such as California quail that use shrubs for cover when not foraging in adjacent open areas. These open areas are critical for annuals that do not compete well with grasses on this ecotone: the rare and endangered Mount Diablo Buckwheat historically occurred here and is an example of a plant that may be dependent on this dynamic.



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Botanical Hot Spots

Colloquially referred to as the "doughnut hole," this BPPA is comprised of privately held lands almost entirely surrounded by state and regional parks. Marsh Creek BPPA has an abundance of exemplary oak woodlands and savannahs, sage scrub, chamise chaparral, and grassland. Mount Diablo fairy lantern (*Calochortus pulchellus*), one of the noteworthy species within this BPPA, occurs on these ecotone hot spots. William Brewer collected the fairy lantern from Mount Diablo in 1862. One of the many namesakes of Mr. Brewer that also occurs in this BPPA is his dwarf flax (*Hesperolinon breweri*) which shares an affinity for the serpentine habitat found here with most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*). Bands of serpentinite that descend from the southern flank of North Peak provide the unique growing grounds that are uncommon in the East Bay and support Serpentine Chaparral.

Sensitive Natural Community

Serpentine Chaparral (1)

Rare and Unique Plant Species

Mount Diablo fairy lantern — *Calochortus pulchellus* (2)

Blue-leaved spring beauty — *Claytonia exigua* ssp. *glauca*

California ash — *Fraxinus dipetala* (3)

Brewer's flax — *Hesperolinon breweri*

Most beautiful jewelflower — *Streptanthus albidus* ssp. *peramoenus* (4)

Threats, Opportunities and Constraints

In the past 15 years, more than 30,000 people have moved into the Marsh Creek watershed. Its headwaters emanate from the northern slopes of Mount Diablo and drain into the western Delta at Big Break 30 miles downstream. The lowlands of this watershed have been aggressively developed. The creek corridor, which is also home to the winding Marsh Creek Road, serves as an important conduit for plants and animals, and any buildout along the road would have negative effects on them. In the mid 1990s, Save Mount Diablo began to build awareness about the value of the Marsh Creek watershed and started advocating for land conservation. As a result, the organization has been able to acquire numerous parcels of land within this BPPA which have been sold to and managed by either California State Parks or by East Bay Regional Park District to create important landscape-scale networks of contiguous wildland. Recently, Save Mount Diablo acquired the 165-acre Viera-North Peak property near the western edge of the Marsh Creek BPPA. This property has some of the finest serpentine habitat on the mountain that includes a new population of Mount Diablo jewel flower (*Strepthanthus hispidus*). Save Mount Diablo has also directed land acquisition efforts at preserving properties that include riparian habitat along Marsh Creek itself. Luckily, with the fiscal support of the new East Contra Costa County Habitat Conservation Plan, more unique lands can be preserved as working landscapes and botanic hot spots.

Botanical Priority Protection Area	
North of Mount Diablo	
Size	6,776 Acres
Watershed Information	
Watershed Based	NO
Watersheds	Little Pine Donner
Significant Substrates	
Total Serpentinite	158 Acres
Serpentinite Extirpated	0%
Serpentinite Extant	100%
Total Sandy Soils	61 Acres
Sandy Soils Extirpated	2%
Sandy Soils Extant	98%
Botanical Attributes	
Locally Rare Plant Occurrences	6
CNDDB Plant Occurrences	7
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	0



Black Diamond Mines Regional Reserve

Greater Lime Ridge

Lime Ridge Open Space

©Iryton

Black Diamond Mines

Chaparral Springs

Clayton Ranch Land Bank

Game Refuge 3-F

Shell Ridge Recreation Area

Diablo Foothills Regional Park

Mount Diablo State Park

Wright Property

Legend

Botanical Priority Protection Area
- North of Mount Diablo

Significant Substrates
- Sandy Soils Extant
- Serpentine Bedrock and Soils

Public Land and Conservation Easements

Access
- Open Access
- Restricted Access
- No Access

East Bay Chapter
California Native Plant Society

1:43,200
0 1,800 3,600
Feet

North of Mount Diablo

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council. Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Clayton, Contra Costa County, California

A Sense of Place

Guest Author
Brad Olson

The lands north of Mount Diablo are dominated by rolling hills of grassland and chaparral on southfacing slopes and blue oak woodland on north facing slopes. Scattered in this topography are stock ponds, seeps and riparian drainages. The geology consists of sedimentary rocks that have been uplifted and exposed at various locations, such as above Stewartville and near Kirker Canyon. This area lacks the steep topography of Mount Diablo, but has its own gentle rural charm. Good views of the Sacramento-San Joaquin Delta and the Sierra Nevada Mountain Range can be had from the ridgelines of the area.

"gentle rural charm"

Small pockets of interesting native vegetation are strewn throughout the area. Silver bush lupine is found growing in small patches of moist grassland near the ridge tops. Black Oak-Hop Tree Woodland can be found just over the east side of these same ridges. Mountain mahogany grows in the steep cool drainages near Clayton Ranch. The diminutive blazing star grows in crevices in the south facing rock outcrops.

The Chamise Chaparral of Irish Canyon contains scattered individuals of the rare Mount Diablo Manzanita and splashes of virgin's bower. Underneath the chamise is a fragrant understory of black sage, pitcher sage, skunkweed and *Pogogyne*. Transitional areas between chaparral and blue oak woodland or grassland support a number of rare and unusual plants, including the locally-endemic Mount Diablo sunflower, Mount Diablo globe lily and serpentine bedstraw.

Native Americans inhabited this area for several hundred years, making use of the abundant acorns from the oaks, and an understory of bulbs, including soap lily and brodiaea. The area has a long history of livestock grazing. Many of the families have been ranching in the area for more than 100 years. Livestock production is becoming less viable in this area as urban encroachment forces ranching families to



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Botanical Hot Spots

This area and the mountain proper are a locus of convergence for plant species from the North and South Coast Ranges. It also bridges the gap between the floristically significant Black Diamond Mines Regional Preserve and Mount Diablo proper. Hot spots of native plant diversity abound here from rich chaparral to bands of serpentinite that support serpentine bunchgrass grassland. The richness of the chaparral is demonstrated by the occurrence of two local endemics, Mount Diablo Manzanita (*Arctostaphylos auriculata*) and Contra Costa manzanita (*Arctostaphylos manzanita ssp. laevigata*). The rich chaparral predominantly occupying southern slopes provides suitable habitat for Hospital Canyon larkspur (*Delphinium californicum ssp. interius*). Although the Mount Diablo buckwheat (*Eriogonum truncatum*) was rediscovered in 2005, the last time this plant was possibly collected from within this BPPA was in 1936 by Mary Bowerman. The label information on that specimen is vague, but it's possible the collection location could have been north of Mount Diablo.

Sensitive Natural Community

Serpentine Bunchgrass Grassland (1)

Rare and Unique Plant Species

Mount Diablo manzanita — *Arctostaphylos auriculata* (2)

Contra Costa manzanita — *Arctostaphylos manzanita ssp. laevigata*

Hospital canyon larkspur — *Delphinium californicum* ssp. *interius* (3)

Diablo helianthella — *Helianthella castanea*

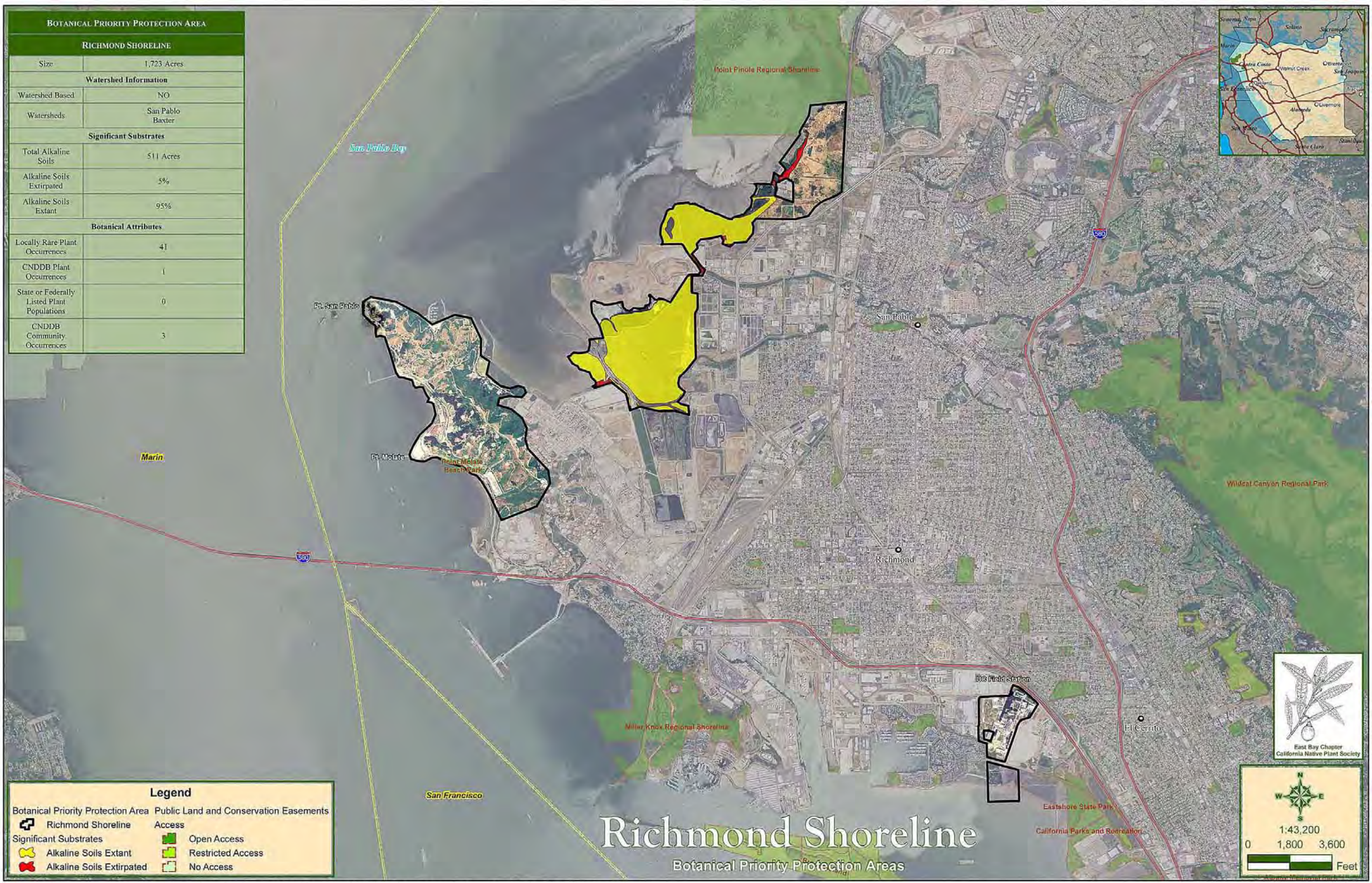
Historic Occurrence

Mount Diablo buckwheat — *Eriogonum truncatum* (1934) (4)

Threats, Opportunities and Constraints

Mount Diablo serves as the meeting point of several botanical subregions: the North Coast, Central Coast, South Coast Ranges, and the Great Valley. The mountain and its foothills have a rich history of exploration and habitation, making it a local favorite for outstanding vistas and natural and cultural history. It is a statewide botanical hot spot known for its rich serpentine, expansive chaparral, and diverse woodlands. Conservation of the mountain began with the early floristic work of Mary Bowerman. Mary was the last surviving student of Willis Linn Jepson who, in turn, was one of the patriarchs of California floristics. Through her groundbreaking flora of Mount Diablo, published in 1944, Mary shed light on the incredible diversity that Mount Diablo supports. Spending many days exploring the mountain, Mary had the foresight to realize that this great treasure would need protecting. Subsequently, she co-founded Save Mount Diablo with the dream "that the whole of Mount Diablo, including its foothills, will remain open space...that the visual and natural integrity will be sustained." Although Save Mount Diablo has preserved about 90,000 acres of land in the immediate vicinity, the northern foothills of this area are under heavy pressure to develop ranchettes and mansions. In the past few years botanical discoveries and rediscoveries have been made. Lime Ridge navarretia (*Navarretia gowenii*) was recently described, and a species once thought to be extinct, Mount Diablo buckwheat (*Eriogonum truncatum*), was re-discovered in a remote area. The rich serpentine barrens and foothills to the north of Mount Diablo may still harbor important discoveries. Luckily, with the fiscal support of the new East Contra Costa County Habitat Conservation Plan, more unique lands within a portion of this BPPA can be preserved as working landscapes and botanic hot spots.

Botanical Priority Protection Area	
Richmond Shoreline	
Size	1,723 Acres
Watershed Information	
Watershed Based	NO
Watersheds	San Pablo Baxter
Significant Substrates	
Total Alkaline Soils	511 Acres
Alkaline Soils Extirpated	5%
Alkaline Soils Extant	95%
Botanical Attributes	
Locally Rare Plant Occurrences	41
CNDDB Plant Occurrences	1
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	3



Legend

Botanical Priority Protection Area
- Richmond Shoreline

Significant Substrates
- Alkaline Soils Extant
- Alkaline Soils Extirpated

Public Land and Conservation Easements
Access
- Open Access
- Restricted Access
- No Access

Richmond Shoreline

Botanical Priority Protection Areas

East Bay Chapter
California Native Plant Society

1:43,200
0 1,800 3,600
Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council. Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Richmond, Contra Costa County, California

A Sense of Place

Guest Author
David Amme

Point Molate is one of the last large relatively undeveloped tracts of shoreline habitat in the East Bay where the hills come right down to the San Francisco Bay. Driving east across the Richmond-San Rafael bridge, you get the best view from a distance of the Potrero Hills and Point Molate looming north of the bridge. I was drawn to explore the grasslands there in the 1970s. I found native red fescue growing in the remnant coastal prairie, a special ecotype that I named "Molate fescue".

"in the rain shadow of Mount Tamalpais"

Point Molate is uniquely situated in the rain shadow of Mount Tamalpais, so it gets less rain than other areas of East Bay shoreline. Geologically and botanically, the point is related to the other highlands in this part of the Bay including the islands and China Camp. Today there are some native plants that occur only in China Camp on the west side and Point Molate on the east. The views are stunning and the sunsets are spectacular. The early summer is the best time to see the grasses. The special combination of climate and topography creates some rare plant communities. There's coastal bluff where you find the live forever, *Dudleya farinosa*, coastal prairie that contains oatgrass, red fescue, purple needlegrass, California melic, Junegrass, Diego bentgrass, and a wonderful array of forbs like narrow leaf mule's ears and pipevine. These and other terrestrial communities include coastal scrub and oak woodland. In the subtidal zone there's one of the largest beds of eelgrass in the Bay, a critically important aquatic habitat.

It's disturbing to see how large the infestations of broom, eucalyptus and pampas grass have become, but for me the most depressing development is the proposal to build a huge casino. It makes no sense to turn a beautiful piece of shoreline property into something you'd find in Las Vegas. I find it hard to believe that Point Molate couldn't be preserved for its unique natural beauty, its abundant natural resources, and its value as open space.

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Botanical Hot Spots

At the westernmost tip of Contra Costa County, the mild climate of the coast shapes the inhabitants of the Richmond Shoreline BPPA. The Golden Gate helps usher in this Pacific infusion by providing its temperature and precipitation regimes to this once common habitat type that skirted the bay. The hot spots of this BPPA are areas where Coastal Terrace Prairie is still intact and native bunchgrass such as California oatgrass (*Danthonia californica* var. *californica*) are co-dominant. Here other species commonly found in coastal environs make an appearance in the East Bay such as a diminutive member of the morning-glory family, California ponysfoot (*Dichondra donelliana*) and the colorful and elegant stonecrop bluff lettuce (*Dudleya farinosa*). True to its name, Pacific gumplant (*Grindelia stricta* var. *platyphylla*) can also be found occupying the windswept coastal bluffs. Although no herbarium collections exist for California mistmaiden (*Romanzoffia californica*), which is more commonly found along the North Coast, there are observation records that indicate this plant species also calls the Richmond Shoreline home. Another coastal hugging species, fragrant fritillary (*Fritillaria liliacea*), was once known from this BPPA. However, it was last collected in 1900 near Point Richmond by Joseph Prince Tracy.

Sensitive Natural Community

Coastal Terrace Prairie (1)

Rare and Unusual Plant Species

California ponysfoot — *Dichondra donnelliana* (2)

Bluff lettuce — *Dudleya farinosa* (3)

Coast gumplant — *Grindelia stricta* var. *platyphylla*(4)

California mistmaiden — *Romanzoffia californica*

Historic Occurrence

Fragrant fritillary — *Fritillaria liliacea* (1900) (5)

Threats, Opportunities and Constraints

Richmond's meandering shoreline is considered the longest of any city in the East Bay. Once the industrial stronghold for the East Bay, Richmond's shoreline factories and operations have faded, leaving behind poverty and pollution. Yet, the promise of environmental justice is still unfulfilled. Much of the shoreline is polluted or scarred, often obscuring the natural value and promise of this area. Thus shoreline development presents itself as a tool to recover prosperity in Richmond, but often at the cost of gentrifying a landscape once inhabited only by factory workers and local fishermen. A strong coalition of environmental and social justice groups are working with the City of Richmond, local labor unions, the East Bay Regional Park District, and local residents to develop a strategy that will protect the important natural resources of the area, which include remnant salt marsh, coastal bluff, and coastal prairie communities, now considered rare and unusual in the East Bay and much of California. Imminent threats to the shoreline include executive housing, another port, and the destruction of coastal prairie by the Campus Bay project at the University of California Richmond Field Station. However, the most potentially destructive project is the massive casino-hotel-ferry terminal complex proposed for Point Molate on the San Pablo Peninsula which may well be tied up in litigation for years to come. An alternative vision for Point Molate and its surroundings is outlined in the San Pablo Peninsula Open Space Study that calls for parks, open space and sustainable development of the historical portions of Point Molate. Visionary restoration and preservation of these areas might well transform a tortured landscape into a source of civic pride, ensuring that this unique stretch of shoreline will endure for generations to come.

Botanical Priority Protection Area	
Sobrante Ridge	
Size	801 Acres
Watershed Information	
Watershed Based	NO
Watersheds	San Pablo
Significant Substrates	
Not Applicable	
Botanical Attributes	
Locally Rare Plant Occurrences	0
CNDDB Plant Occurrences	1
State or Federally Listed Plant Populations	1
CNDDB Community Occurrences	0



Legend

Botanical Priority Protection Area
Sobrante Ridge

Public Land and Conservation Easements
Access
Open Access
Restricted Access
No Access

Sobrante Ridge

Botanical Priority Protection Areas

East Bay Chapter
California Native Plant Society

1:33,600
0 1,400 2,800
Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council. Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Richmond, Contra Costa County, California

A Sense of Place

Guest Author
Gudrun Kleist

Although located at the northern end of the highly populated East Bay Hills and surrounded by residential subdivisions, the Sobrante Ridge BPPA is a great place to find solitude. I live within walking distance of this extraordinary example of Northern Maritime Chaparral and have visited it nearly every day for the past 22 years. To me the most appealing aspect of the ridge is the incredible views of Mount Diablo to the east, Mount Tamalpias to the west, San Pablo Bay to the north, and San Pablo Ridge to the south.

"manzanita trunks glisten burgundy"

Regionally, this BPPA is significant as it supports the northernmost population of the federally listed pallid manzanita (*Arctostaphylos pallida*) whose worldwide distribution lies here and in the Oakland hills to the south. Seasonally the best time to visit Sobrante Ridge is in December to see the pallid manzanita in bloom, especially on a morning after a rain storm, when the view from the top is breathtaking and Mount Diablo is covered in snow. Winter puts on a show of color: the manzanita trunks glisten burgundy, while those of the huge madrones reflect a warm orange hue, and the ground is covered in manzanita snow comprised of the small urn-shaped blossoms that have fallen to the ground. In full bloom these corollas attract droves of bumblebees who do their work to help these manzanitas produce the seeds of the next generation.
However, during any season Sobrante Ridge provides delightful encounters. In the spring Indian warrior (*Pedicularis densiflora*) can blanket the oak understory with its deep red color complementing the vibrant blue of the hound's tongue (*Cynoglossum grande*). Out in the scrub, the bright yellow-orange of the bush monkeyflower (*Mimulus aurantiacus*) is appealing not only to the human eye but also to the energetic hummingbirds that drink the sweet nectar. Watching the fog roll over San Pablo Ridge in the summer reminds you of how close you are to the coast as it chills you to the bone. And during the fall months even the common native plants provide you with special treats to your senses such as the scent of coyote brush (*Baccharis pilularis*) in bloom.



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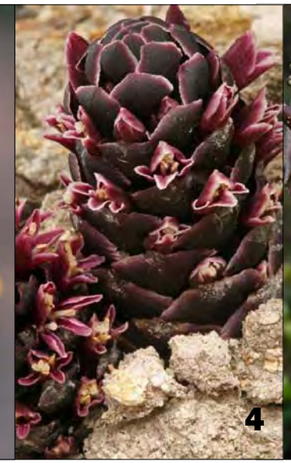




Botanical Hot Spots

Near the northern end of the Bay Hills lies the Sobrante Ridge BPPA. Here, sandstone from the Miocene provides the foundation of support for a community of plants known as Northern Maritime Chaparral. The combination of geology and plant associations equals a hot spot that is nearly unrivaled in diversity and rarity along this western corridor of relief. The most notable member of this community is the pallid manzanita (*Arctostaphylos pallida*). Sobrante Ridge is the northernmost station for this East Bay endemic. One of the earliest flowering shrubs in our chapter area, the beautifully distinctive western leatherwood (*Dirca occidentalis*), is known from nearby Wildcat Canyon. Another woody associate of this BPPA is Shreve's oak (*Quercus parvula* var. *shrevei*). Sobrante Ridge is the only place where this oak grows in the East Bay. Bent-flowered fiddleneck (*Amsinckia lunaris*) can be found on the ecotone of scrub and woodland communities. California groundcone (*Boschniakia strobilacea*), named after the Russian botanist, Boschniaki, has also been observed here. California groundcone is a root parasite that uses *Arctostaphylos* or *Arbutus* species as its host.

Sensitive Natural Community

Northern Maritime Chaparral (1)

Rare and Unique Plant Species

Pallid manzanita — *Arctostaphylos pallida* (2)

Bent-flowered fiddleneck — *Amsinckia lunaris* (3)

Boschniakia — *Boschniakia strobilacea* (4)

Western leatherwood — *Dirca occidentalis* (5)

Shreve's oak — *Quercus parvula* var. *shrevei*

Threats, Opportunities and Constraints

Sobrante Ridge is tucked away in the northwestern part of the East Bay. Its Spanish name refers to its historical designation as surplus land by the Mexican government. Now the ridge and the surrounding area are under tremendous development pressure. Located on the rural boundary of Contra Costa County and the cities of Richmond and Pinole, this 288-acre preserve could be a cornerstone of a larger reserve network of important areas of native plant communities and floral diversity. Although these priority protection areas are located primarily on steep, undevelopable lands, urbanization is affecting the local environment. Many of the rare taxa are found in the maritime chaparral ecosystem, located on the cooler northern and eastern slopes. As more land becomes developed, local temperatures can increase significantly, producing an urban heat-island effect. Exposure to warmer temperatures and the shading effects of a rapidly intruding overstory put the plants of this system at greater risk of population decline. Although prescribed fire at the urban-wildland interface carries risks to public health and safety, many of the plants, including the pallid manzanita, require fire to germinate their seeds and maintain open exposure to sunlight. Additionally, a new *Phytophthera* pathogen (related to sudden oak death) has been found to infect and kill the pallid manzanita. In the past, well intentioned efforts have had detrimental effects on the vegetation. About ten years ago, grazing was introduced into this area and the goats managed to consume the only known patch of naked-stem buckwheat (*Eriogonum nudum* var. *auriculatum*), which has not reappeared since. In its place, yellow star thistle has exploded onto the ridge. This small but important patch of maritime chaparral serves as a critical repository for many endemic and unusual plants, but unless the site is actively managed, including preventing the alteration of the local climate by too much development, its botanic value may soon disappear.

Botanical Priority Protection Area	
Foothills of South Oakland	
Size	1,440 Acres
Watershed Information	
Watershed Based	NO
Watersheds	Country Club Branch San Leandro Creek
Significant Substrates	
Not Applicable	
Botanical Attributes	
Locally Rare Plant Occurrences	7
CNDDB Plant Occurrences	4
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	1

Redwood Regional Park

Leona Heights Regional Open Space

EBMUD

Oakland

Knight Estate

Anthony Chabot Regional Park

Dunsmuir Estate Park

MLK Regional Shoreline

Legend

Botanical Priority Protection Area
Foothills of South Oakland

Public Land and Conservation Easements
Access
- Open Access
- Restricted Access
- No Access

Foothills of South Oakland

Botanical Priority Protection Areas

East Bay Chapter
California Native Plant Society

1:36,000
0 1,500 3,000
Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Oakland, Alameda County, California

A Sense of Place

Guest Author
Mike Preston

These hills are dominated by an extensive and beautiful oak woodland, of fairly low stature but probably great age, considering the many ring-clones, some up to a dozen trunks, evidence of past fire cycles. The woodland is a prominent and pleasant feature as seen from eastbound 580 near the confluence with highway 13: the Leona Greenbelt. It is punctuated with pockets of chaparral constiuents (*Adenostoma fascicularis* and *Arctostaphylos tomentosa*) and grassland on the the steep southern exposures, and some fine patches of softer coastal scrub and grassland on more mesic western slopes.

What I most love about my explorations here is the feeling of wildness, in a place bracketed by two freeways and a ridgeline full of houses. It's hardly pristine; there is evidence of past mining activity throughout, and a sewer right-of-way cuts down from the housing towards Mountain Boulevard, attended by acacia, pampas grass, broom and other camp-followers.

"wildness, in a place bracketed by two freeways"

But there are many, many special spots that almost are pristine. It sports a glorious slope of *Festuca californica* that is not far from the biggest patch of *Trillium choropetalum* I've ever seen in the East Bay. There is a goodly patch of *Silene californica,* dazzling in the scrub near an oak-covered knob worthy of any druid. A steep canyon face I-580 with native snapdragon, most-beautiful jewelflower, Venus thistle, California melic, mules ears, and many other grassland species. Much of the place is rugged like this, and it's easy to feel thoroughly alone, especially since most of it is accessible only on deer trails. And it is changeable: probably as a function of its highly dissected terrain and its fire and mining history, there are many transitions between closed and open vegetation of various types and mixtures. An intriguing place.



EAST BAY
CNPS











Botanical Hot Spots

These hills overlooking the San Francisco and Oakland skylines support a profusion of native bunchgrasses. Knowland Park is a hot spot for the native Valley Needlegrass Grassland, which is dominated by the official state grass of California, purple needlegrass (*Nassella pulchra*). In these hills small unmapped lenses of serpentinite that support chaparral and open woodlands provide the preferred habitat for Oakland star tulip (*Calochortus umbellatus*). It is only within this BPPA that two sedge species which are locally uncommon--many ribbed sedge (*Carex multicostata*) and Dudley's sedge (*Carex dudleyi)* make an appearance in dry and mesic grasslands. A seldom seen plant species in the East Bay that prefers a variety of habitats including seeps, dry streambeds, scrub, or woodland habitats throughout the California Floristic Province is grayleaf skullcap (*Scutellaria siphocampyloides*). This species has been recorded from Hayward, possibly occurring within the boundaries of the South Oakland BPPA. Somewhere in the Leona Hills in 1891 Katherine Brandegee collected knotweed spineflower (*Chorizanthe polygonoides* var. *polygonoides*), one of the few spineflowers known from our chapter area.

Sensitive Natural Community

Valley Needlegrass Grassland (1)

Rare and Unique Plant Species

Oakland star tulip — *Calochortus umbellatus* (2)

Dudley's sedge —*Carex dudleyi*

Many ribbed sedge —*Carex multicostata* (3)

Gray-leaved skullcap —*Scutellaria siphocampyloides* (4)

Historic Occurrence

Knotweed spineflower —*Chorizanthe polygonoides* ssp. *polygonoides* (1891) (5)

Threats, Opportunities and Constraints

The hills of Oakland overlook an expansive urban area that provides habitat for a population of nearly 750,000 people. The ridgeline serves as a remnant of a once vibrant natural landscape, much of which has been preserved by the East Bay Regional Park District and local cities. Despite considerable development, there are still surprisingly intact yet unprotected viable natural areas that continue to thrive. With active city parks departments and the regional park district and with recent funding from the passage of Measure WW, there are opportunities to raise awareness about these areas and to preserve and manage them before they fall prey to developers interested in building low density suburban housing. These lands are potential open spaces and parks that retain value for people seeking recreational opportunities near the cities where they live. They also provide habitat for native plants and wildlife. In addition to development, a second major threat is fire at the urban-wildland interface. Many parks have become hotbeds of weed invasion, and numerous unmanaged non-native eucalyptus and pine plantations have created a build-up of dangerous fuels that, in combination with the incursion of homes pressing into wildland areas, creates an increased risk of catastrophic fire. With this BPPA we hope to connect some of the fragments of native landscape to the existing matrix of parks on the urban fringe. We also are encouraging the wise management of vegetation at the interface to promote healthy native plant communities and combat the invasion of weeds.

Botanical Priority Protection Area	
Springtown	
Size	23,593 Acres
Watershed Information	
Watershed Based	YES
Watersheds	Cayetano Brushy Peak Altamont
Significant Substrates	
Total Alkaline Soils	2,313 Acres
Alkaline Soils Extirpated	28%
Alkaline Soils Extant	72%
Botanical Attributes	
Locally Rare Plant Occurrences	29
CNDDB Plant Occurrences	24
State or Federally Listed Plant Populations	9
CNDDB Community Occurrences	1



Vasco Caves

Vasco Caves Land Bank

Los Vaqueros Watershed

Bethany Reservoir

Los Vaqueros Reservoir

Brushy Peak

Brushy Peak Regional Preserve

Livermore Monitoring Station

Springtown Wetlands Preserve

Springtown Preserve

Caravanda Wetlands Preserve

580

Livermore

Legend

Botanical Priority Protection Area
- Springtown

Significant Substrates
- Alkaline Soils Extant
- Alkaline Soils Extirpated

Public Land and Conservation Easements
Access
- Open Access
- Restricted Access
- No Access

East Bay Chapter
California Native Plant Society

1:57,600
0 2,400 4,800
Feet

Springtown

Botanical Priority Protection Areas

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North.

Livermore, Alameda County, California

A Sense of Place

Guest Author
Mary Ann Showers

The Springtown Alkali Sink is unique both in setting and in its assemblage of plants. Although it shares similar characteristics with other alkali sinks found in the northern part of the Central, as well as the San Joaquin Valley, it's disjunct from them. The most genetically diverse population of the endangered palmate-bracted bird's-beak is found at Springtown, which also supports a number of special status animal species.

There are many appealing aspects to Springtown. Four major types of vegetation are found at there: vernal pools and swales, alkali grassland, annual grassland, and Iodine Bush Scrub. Vernal pools and swales occur in low areas between mounds of iodine bush and in the grasslands. In early spring, the yellow blooms of stickyseed and goldfields provide a vivid display along with other native grassland wildflowers including blankets of rose and pink checkerbloom, sky blue lupine, fiddleneck, and clover. Late flowering annual plants include spikeweed, so named for its spiny stems, and the gray-leaved alkali weed.

"resinous scent of yellow tarplants in flower"

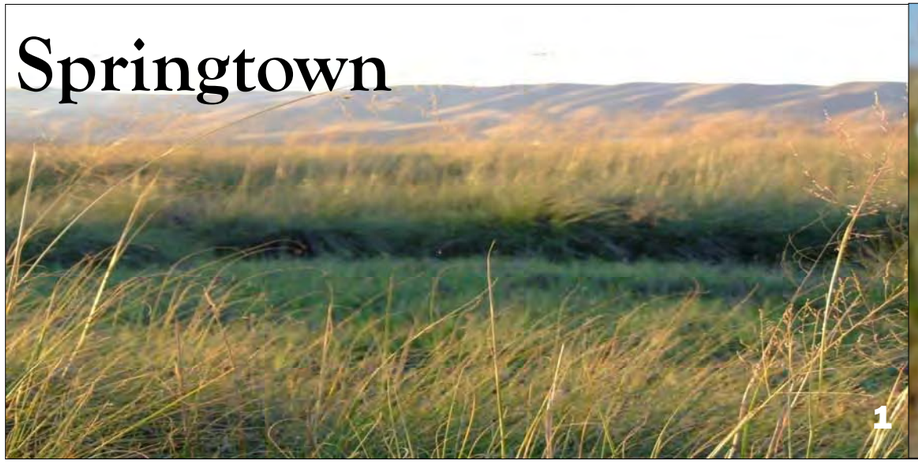
Drought tolerant flowering plants come into prominence with the onset of summer. The resinous scent of yellow tarplants in flower hangs heavy in the air. Springtown supports the unique late-flowering Livermore tarplant. Palmate-bracted bird's beak is in full bloom with pinkish-purple flowers and glistening wet flower stalks. Hispid bird's beak, which has small white flowers set in a bristly flower stem, is also in bloom.

There have been many changes that have threatened the complex ecology of Springtown including grading, off-road vehicle and bicycle use and illegal dumping. Increased development has changed the hydrology of the sink, especially with the deepening and concrete lining of Altamont Creek. Overland flows of water have been decreased, altering the vegetation.

Springtown is an important site to protect and restore. In addition to its open space values, the botanical resources are unique and it provides habitat for many species of wildlife in an increasingly developed region.



EAST BAY CNPS









Botanical Hot Spots

While the entire Springtown area supports a unique diversity of local endemics, natural communities, and state and federally listed rare plants, the hot spot of botanical diversity in this BPPA is within and around the City of Livermore's Springtown Wetlands Preserve. This area is bound by the Springtown subdivision to the south, Raymond Road to the north, Lorraine Road to the west, and Ames Road to the east. The population of palmate-bracted bird's beak found at the Wetlands Preserve is the western-most occurrence of this taxon. Equally as important, one of the few Livermore tarplant occurrences is located in an isolated lot along Greenville Road, which is in desperate need of conservation. Also, Hoover's downingia was last collected by Rimo Bacigalupi in this area in 1957. It hasn't been seen since.

Sensitive Natural Community

Alkali Sacaton Grassland (1)

Rare and Unique Plant Species

Heartscale - *Atriplex cordulata* (2)

Hispid bird's beak - *Cordylanthus mollis* ssp. *hispidus*

Palmate-bracted bird's beak - *Cordylanthus palmatus* (3)

Livermore tarplant - *Deinandra bacigalupi*

Historic Occurrence

Hoover's downingia - *Downingia bella* (1957) (4)

Threats, Opportunities and Constraints

The Springtown alkali sink ecosystem occupies lands immediately north of Livermore's "Springtown" subdivision. Sadly, since 1962 Springtown has been disced, used as a city dump, used for placement of fill, and for residential development. Its main tributary, Altamont Creek, has also been realigned and widened for flood control purposes. Development proposals for vineyards and orchards regularly press upon the boundaries of Springtown's core alkali area, as well as up watershed from the Sink proper. As the Livermore Valley continues to grow, the protection of this resource and its surrounding hills will become more difficult as development activity closes in on the populations of rare plants and threatens the sink's supporting hydrology. Additional threats to this area include invasive weeds, especially grasses, that have invaded the sink in areas where the hydrology was modified. These annual grasses, which desiccate in the early summer, now fill in the open spaces between the iodine bush individuals. The carpet of grasses make the fuels more continuous throughout the site, thus this area is more fire prone.

Although a management plan has been written by qualified biologists, it has not been implemented. A group of local citizens concerned about the health of this area has recently formed an organization called Friends of Springtown Preserve. The mission of the organization is to create a greater awareness about this invaluable resource and aid in efforts to conserve it. Recent efforts to create a regional conservation strategy (the Eastern Alameda County Conservation Strategy) are underway which may hopefully help increase regional involvement in preserving this important area.

Botanical Priority Protection Area	
Warm Springs	
Size	2,605 Acres
Watershed Information	
Watershed Based	NO
Watersheds	Newark Slough
Significant Substrates	
Not Applicable	
Botanical Attributes	
Locally Rare Plant Occurrences	0
CNDDB Plant Occurrences	9
State or Federally Listed Plant Populations	0
CNDDB Community Occurrences	1

Fremont

Fremont Central Park

Newark

880

Mission Peak Regional Preserve

Rancho Higuera Park

San Francisco Bay

Don Edwards National Wildlife Refuge

Santa Clara

Legend

Botanical Priority Protection Area
- Warm Springs

Public Land and Conservation Easements

Access
- Open Access
- Restricted Access
- No Access

Warm Springs

Botanical Priority Protection Areas

East Bay Chapter
California Native Plant Society

N
W E
S

1:43,200

0 1,800 3,600

Feet

Soil information created from the Natural Resouce Conservation Service SSURGO data and the State of California's Farmland Mapping and Monitoring Program. Public land and easement data provided by the Bay Area Open Space Council.
Water body and waterway data furnished by Contra Costa Information Technology Department and the U.S. Geologic Survey. Road and place name data provided by ESRI. Projection: NAD 1983 UTM 10 North

Fremont, Alameda County, California

A Sense of Place

Guest Author
Peter Baye

Warm Springs is the last remnant of alkali grasslands bordering South San Francisco Bay. This bayside habitat represents a taste of our South Bay alluvial grassland legacy, a once dominant landscape feature of the San Francisco Estuary, where wet grasslands intergraded with estuarine brackish or saline marshes. Although currently severed from the Bay by dikes and railways, Warm Springs has retained or regenerated much of its bay-edge seasonal wetland legacy: vernal marshes and pools, creeping wildrye and sedge meadows, intergrading with salt marsh vegetation.

"a once dominant landscape feature"

The Warm Springs grassland remnants are far from pristine. In fact, even the extant grasslands are a mosaic of "unmodified" areas and other fields that are regenerated from a long history of agricultural land use. Additionally, the grasslands are highly modified by naturalized and invasive species, soil and drainage modifications, but they still support very significant and persistent populations of vernal pool/salt marsh and alkali grassland species that are now either uncommon or rare in San Francisco Baylands: Contra Costa goldfields (*Lasthenia conjugens*), downingia (*Downingia pulchella*), large meadows dominated by creeping wildrye (*Leymus triticoides*), spikerush marsh swales (*Eleocharis macrostachya*), seepweed (*Suaeda moquinii*), water-clover fern (*Marsilea vestita)*, and shrubby pickleweed (*Arthrocnemum subterminale*).

Warm Springs has little or no public access, but the spring wildflower blooms in alkali-subsaline vernal pools are quite spectacular. These blooms have historic importance as well: they convey a sense of place that can otherwise be grasped only through historic documentation. Even as this piece is written, additional proposals are being made that will impact these habitats. The ongoing fragmentation, incursions of development and compensatory mitigation, degradation due to nutrient accumulation and invasive plants, and constraints of infrastructure impede proper management and restoration of the greater ecosystem.

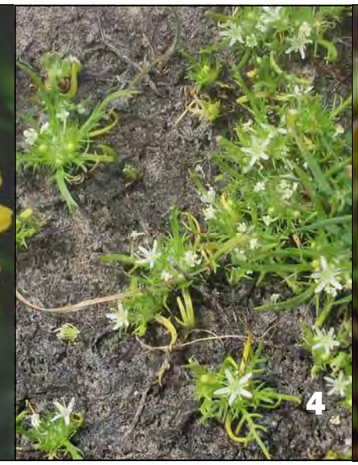


EAST BAY
CNPS











Botanical Hot Spots

The vernal pools of Warm Springs are the definitive hotspot for this area. One of these species is an annual milk-vetch (*Astragalus tener* var. *tener*), which is more commonly found in the Great Valley, is at one of two of its westernmost stations here. An uncommon member of the Carrot Family, Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*), a near vernal pool obligate, makes its northernmost appearance here. Contra Costa goldfields (*Lasthenia conjugens*), one of California's most rare plant species, have also been recorded from this vicinity. Another associate of the vernal pools is prostrate navarretia (*Navarretia prostrata*). A member of the phlox family, it was recorded as an associate of Contra Costa goldfields within this BPPA and is known only from one other station in the East Bay. David Keck last collected smooth tidy tips (*Layia chrysanthemoides*) from this portion of our chapter in 1933.

Sensitive Natural Community

Northern Claypan Vernal Pool (1)

Rare and Unique Plant Species

Alkali milk-vetch - *Astragalus tener* var. *tener* (2)

Hoover's eryngium - *Eryngium artistulatum* var. *hooveri*

Contra Costa goldfields - *Lasthenia conjugens* (3)

Prostrate navarretia - *Navarretia prostrate* (4)

Historic Occurrence

Smooth tidytips - *Layia chrysanthemoides* (1931)(5)

Threats, Opportunities and Constraints

Warm Springs represents some of the last relatively intact areas of bayside flatlands that transition to tidal ecosystems in the East Bay. Surrounded by industrially abused lands of Newark and Fremont, this BPPA still supports Northern Claypan Vernal Pools that were formerly abundant in this transition zone prior to European settlement. The perched water tables, soils with elevated pH, and vernal hydrology of these pools invite species characteristic of this habitat. Warm Springs is a small but important site situated within the US Fish and Wildlife Service Don Edwards National Wildlife Refuge near Fremont in one of the largest tracts of contiguous salt marsh in the Bay Area. The expanse of bay shoreline stretching from Richmond to San Jose is afforded to various levels of protection by federal, state, and local agencies. Regulation and management by multiple agencies presents a challenge in working together effectively to achieve consensus, but also offers exciting opportunities for partnerships. The US Fish and Wildlife Service is preparing a Bay Area Salt Ponds Restoration Plan which will help provide a regional context to protecting local sites supporting sensitive botanical resources. Once a prominent stronghold of industry in the East Bay, these wetlands are now being reconstructed into natural habitat. Many of these transfers from industry to protected lands come at a cost. Tradeoffs usually allow some degree of encroachment upon these remnant wetlands through development such as residential subdivisions, commercial areas, and ballparks. A network of environmental groups and agencies has come together to help preserve the best of the remaining bay shoreline, with particular emphasis on retaining important habitat for migrating birds. Given that Warm Springs includes a significant and potentially imperiled botanical hot spot, we hope that its protection will also be secured.

About the Contributors and Authors

David Amme is the Wildlands Vegetation Program Manager for the East Bay Regional Park District. David has a MS degree in Range Management from U.C. Berkeley. He is a long time member of the California Native Plant Society (CNPS) and collector of many native plant cultivars. David is one of the founding members of the California Native Grass Association (CNGA), the California chapter of the Society for Ecological Restoration (SERCAL), and the California Invasive Plant Council (Cal-IPC).

Laura Baker is in her fifth year as chair of the Conservation committee of the East Bay Chapter of CNPS. After completing her MA in Biology at SFSU in 1976, she worked with Friends of the Earth to defeat a proposed petrochemical plant downstream from Suisun marsh in Solano County. He experience there sparked a decades-long interest in volunteering with a variety of organizations to protect and preserve the East Bay's remaining natural resources.

Bruce Baldwin is Curator of the Jepson Herbarium and Professor of Integrative Biology at UC Berkeley, where he oversees the Jepson Flora Project and studies evolutionary diversification of California plants. Revision of The Jepson Manual has been one of his major priorities in recent years.

Heath Bartosh is acting chair of the Rare Plant Committee of East Bay CNPS and on the State Rare Plant Program Committee. He ensures these programs continue to develop current, accurate information on the distribution, ecology and conservation status of California's rare and endangered plants. He helps to promote the use of this information to influence plant conservation. He is Founding Principal and Senior Botanist at Nomad Ecology.

Peter Baye, Ph.D., is a coastal plant ecologist with 30 years professional experience in conservation and management of coastal vegetation. He currently works as an independent applied ecologist providing technical support for coastal vegetation and habitat restoration projects, endangered species recovery projects in the California coast region.

Stephen W. Edwards, Ph.D., has been director of the Regional Parks Botanic Garden of the East Bay Regional Park District since 1983. His interests include field botany, earth sciences, horticulture, and conservation.

John Game is associated with the UC and Jepson herbaria and is on the Board of Directors of Calflora. He was actively involved with CNPS for many years and is a noted plant photographer.

David Gowen is a self-trained botanist who has recently discovered a new species of *Navarretia* in the East Bay. He volunteers at the Jepson Herbarium regularly.

Gudrun Kleist is a native of Germany but has lived in the East Bay for many years where she has been transforming my back yard in El Sobrante into a Native plant garden and wildlife habitat. She gets her inspiration from many hikes at Sobrante Ridge and our other beautiful East Bay Parks.

Dianne Lake is the Rare and Unusual Plant Committee Chair and East Bay CNPS board member of many years. Dianne published the "Locally Rare and Unusual Plants Guide to the East Bay", a publication that is heavily cited in the region.

Erin McDermott is a Principal, Botanist, Arborist, and Wetland Specialist with Nomad Ecology. Erin serves as Chairperson of the Vegetation Committee of the East Bay Chapter of CNPS and is on the Vegetation Committee at the state level of CNPS.

Lech Naumovich promotes community-driven conservation efforts in the East Bay. By leading tours, meeting with stakeholders, and providing technical comments, Lech communicates important information onto decision-makers. He also works as an independent botanical and conservation consultant. Lech is a Founding Director of Golden Hour Restoration Institute.

Brad Olson is Environmental Programs Manager at the East Bay Regional Park District. He has developed and managed ecological restoration projects for the past twenty years. Brad served for ten years as Rare Plant Chair for the East Bay Chapter of the California Native Plant Society and he has contributed to numerous botanical publications and conducted studies of the East Bay flora for more than twenty years.

Mike Park is a graduate student at the University of California at Berkeley. His research focuses on the phylogeography and evolution of *Eryngium* and the floristics of Western North America.

Mike Preston is a retired horticulturalist/landscaper who got hooked on native plants through the many classes and workshops on their garden uses offered around the Bay Area. That gave increasing focus to his regular hikes in the wild areas over the years, motivating him to become a decent amateur botanist. He is still wandering the hills.

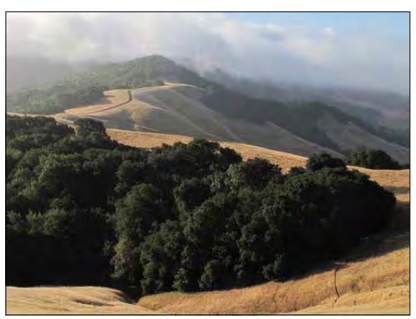
Mary Ann Showers serves as the lead botanist in the California Department of Fish and Game Rare Plant Program. In this role, Mary Ann works with botanists statewide to conserve listed plant species. Mary Ann has had a long interest in the conservation of palmate-bracted bird's-beak which occurs at Springtown Alkali Sink and several other locations in the Central Valley.

Christopher Thayer is a California botanist and naturalist based in the East Bay, where he has lived and explored for nearly half a century. He has a special interest in the unique ecological niches provided by isolated or unusual vegetation communities, in frequent association with locally noteworthy geological features.
He works independently as a biological consultant, with an emphasis on field studies of rare plants, animals, wetlands, and other habitats.

Mike Wood is co-chair of the rare plant committee of the Yerba Buena Chapter (San Francisco) of CNPS and is currently developing the chapter's significant plant species list. He writes the regular feature "Focus on Rarities" for the chapter newsletter. He has worked as a professional botanist and vegetation ecologist in the Bay Area for over 20 years.

Elizabeth H. Zacharias, Ph.D., is the Vascular Plant Research and Curatorial Associate at the Harvard University Herbaria. She studies evolution and systematics with a particular focus on the California flora, plants in alkaline areas, and conservation.

The authors are thankful for the generous financial support from the Tides and Rose Foundations.



EAST BAY
CNPS

CNPS - Dedicated to the preservation of California native flora

Photography Credits

Aaron Schusteff - - *California macrophylum, Delphinium recurvatum, Trifolium depauperatum* var. *hydrophilum, Fraxinus dipetala*

A"Don"is Tate - *Atriplex serenana* var. *serenana*

Beatrice Howitt - *Caulanthus coulteri* var. *lemmonii*

Christopher Christie - *Delphinium hansenii, Downingia bella*

Carol Witham - *Microseris campestris, Navarretia leucocephala* var. *leucocephala, Triphysaria versicolor* var. *faucibarbata, Astragalus tener* var. *tener, Layia chrysanthemoides*

Doreen L. Smith - *Dichondra donnelliana, Amsinckia lunaris*

David Tharp - *Madia radiata*

George Hartwell - *Delphinium graciolentum, Atriplex cordulata*

Heath Bartosh – Credits page photo – Mt. Diablo

Ivette Loretto - *Navarretia prostrata*

John Game – All page 1 photos, *Calochortus invenustrus, Fritilaria falcata, Navarretia nigelliformis* ssp. *nigelliformis, Fritillaria liliacea*

Laura Eliassen - *Tropidocarpum capparideum, Pentachaeta exilis* ssp. *exilis*

Lara Hartley - *Camissonia boothii* ssp. *decorticans*

Lech Naumovich – All page 2 photos, Valley Sink Scrub, Akali Meadow, *Fritillaria agrestis,* Desert Olive Scrub, *Cirsium fontinale* var. *campylon,* Northern Coastal Salt Marsh, Stabilized Interior Dunes, *Oenothera deltoides* ssp. *howelli,* Northern Claypan Vernal Pool, *Centromadia parryii* ssp. *congdonii,* Wildflower Field, *Streptanthus albidus* ssp. *peramoenus,* Serpentine Bunchgrass Grassland, Coastal Terrace Prairie, Northern Maritime Chaparral, *Arctostaphylos pallida,* Valley Needlegrass Grassland, Alkali Sacaton Grassland, *Cordylanthus palmatus,* Northern Claypan Vernal Pool (2)

Margaret Ely - *Aster lentus*

Mark Fogiel - *Lathyrus jepsonii* var. *jepsonii*

Marguerite Gregory - *Dudleya farinosa*

Neal Kramer - *Grindelia stricta* var. *platyphylla, Dirca occidentalis, Calochortus umbellatus*

Rob Preston - *Atriplex depressa, Blepharizonia plumosa, Cordylanthus mollis* ssp. *mollis*

Steve Edwards – Northern Interior Cypress Forest

Scott Hein - *Calochortus pulchellus, Delphinium californicum* ssp. *interius, Eriogonum truncatum*

Steve Matson - *Malacothrix coulteri, Nitrophilia occidentalis, Phacelia douglasii, Arctostaphylos auriculata, Boschniakia strobilacea, Carex multicostata*

Toni Corelli – Serpentine Chaparral

Yulan Tong - *Streptanthus breweri*

Appendix 5.4-2 California Department of Fish and Wildlife: RareFind Report, Contra Costa County

Appendices

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CALIFORNIA DEPARTMENT OF FISH and WILDLIFE **RareFind**

Query Summary:
County IS (Contra Costa)

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Accipiter cooperii	Cooper's hawk	Birds	ABNKC12040	118	2	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Riparian forest, Riparian woodland, Upper montane coniferous forest
Acipenser medirostris pop. 1	green sturgeon - southern DPS	Fish	AFCAA01031	14	2	Threatened	None	G2T1	S1	null	AFS_VU-Vulnerable, IUCN_EN-Endangered	Aquatic, Estuary, Marine bay, Sacramento/San Joaquin flowing waters
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	955	11	None	Threatened	G1G2	S1S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Alkali Meadow	Alkali Meadow	Herbaceous	CTT45310CA	8	6	None	None	G3	S2.1	null	null	Meadow & seep, Wetland
Alkali Seep	Alkali Seep	Herbaceous	CTT45320CA	10	1	None	None	G3	S2.1	null	null	Meadow & seep, Wetland
Ambystoma californiense pop. 1	California tiger salamander - central California DPS	Amphibians	AAAAA01181	1271	216	Threatened	Threatened	G2G3T3	S3	null	CDFW_WL-Watch List, IUCN_VU-Vulnerable	Cismontane woodland, Meadow & seep, Riparian woodland, Valley & foothill grassland, Vernal pool, Wetland
Amsinckia grandiflora	large-flowered fiddleneck	Dicots	PDBOR01050	9	4	Endangered	Endangered	G1	S1	1B.1	SB_UCBG-UC Botanical Garden at Berkeley	Cismontane woodland, Valley & foothill grassland
Amsinckia lunaris	bent-flowered fiddleneck	Dicots	PDBOR01070	93	25	None	None	G3	S3	1B.2	BLM_S-Sensitive, SB_UCBG-UC Botanical Garden at Berkeley, SB_UCSC-UC Santa Cruz	Cismontane woodland, Coastal bluff scrub, Valley & foothill grassland
Andrena blennospermatis	Blennosperma vernal pool andrenid bee	Insects	IIHYM35030	15	1	None	None	G2	S1	null	null	Vernal pool
Anniella pulchra	Northern California legless lizard	Reptiles	ARACC01020	383	8	None	None	G3	S2S3	null	CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Chaparral, Coastal dunes, Coastal scrub
Anomobryum julaceum	slender silver moss	Bryophytes	NBMUS80010	13	1	None	None	G5?	S2	4.2	null	Broadleaved upland forest, Lower montane coniferous forest, North coast coniferous forest
Anthicus antiochensis	Antioch Dunes anthicid beetle	Insects	IICOL49020	6	1	None	None	G3	S3	null	null	Interior dunes
Antrozous pallidus	pallid bat	Mammals	AMACC10010	420	12	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-	Chaparral, Coastal scrub, Desert wash, Great Basin grassland, Great

											Least Concern, USFS_S-Sensitive	Basin scrub, Mojavean desert scrub, Riparian woodland, Sonoran desert scrub, Upper montane coniferous forest, Valley & foothill grassland
Apodemia mormo langei	Lange's metalmark butterfly	Insects	IILEPH7012	1	1	Endangered	None	G5T1	S1	null	null	Interior dunes
Aquila chrysaetos	golden eagle	Birds	ABNKC22010	325	16	None	None	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, CDFW_WL-Watch List, IUCN_LC-Least Concern	Broadleaved upland forest, Cismontane woodland, Coastal prairie, Great Basin grassland, Great Basin scrub, Lower montane coniferous forest, Pinon & juniper woodlands, Upper montane coniferous forest, Valley & foothill grassland
Archoplites interruptus	Sacramento perch	Fish	AFCQB07010	5	3	None	None	G1	S1	null	AFS_TH-Threatened, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered	Aquatic, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters
Arctostaphylos auriculata	Mt. Diablo manzanita	Dicots	PDERI04040	17	17	None	None	G2	S2	1B.3	SB_UCSC-UC Santa Cruz	Chaparral, Cismontane woodland
Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	Dicots	PDERI04273	10	10	None	None	G5T2	S2	1B.2	SB_UCSC-UC Santa Cruz	Chaparral
Arctostaphylos pallida	pallid manzanita	Dicots	PDERI04110	9	6	Threatened	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Chaparral, Cismontane woodland, Closed-cone coniferous forest, Coastal scrub
Arizona elegans occidentalis	California glossy snake	Reptiles	ARADB01017	260	1	None	None	G5T2	S2	null	CDFW_SSC-Species of Special Concern	null
Asio flammeus	short-eared owl	Birds	ABNSB13040	11	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Marsh & swamp, Meadow & seep, Valley & foothill grassland, Wetland
Astragalus tener var. tener	alkali milk-vetch	Dicots	PDFAB0F8R1	65	4	None	None	G2T1	S1	1B.2	SB_UCSC-UC Santa Cruz	Alkali playa, Valley & foothill grassland, Vernal pool, Wetland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	2011	110	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex cordulata var. cordulata	heartscale	Dicots	PDCHE040B0	66	1	None	None	G3T2	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland
Atriplex depressa	brittlescale	Dicots	PDCHE042L0	60	11	None	None	G2	S2	1B.2	null	Alkali playa, Chenopod scrub, Meadow & seep, Valley &

												foothill grassland, Vernal pool, Wetland
Blepharizonia plumosa	big tarplant	Dicots	PDAST1C011	53	28	None	None	G1G2	S1S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Valley & foothill grassland
Bombus caliginosus	obscure bumble bee	Insects	IIHYM24380	181	8	None	None	G2G3	S1S2	null	IUCN_VU-Vulnerable	null
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	437	2	None	Candidate Endangered	G2	S2	null	IUCN_EN-Endangered	null
Bombus occidentalis	western bumble bee	Insects	IIHYM24252	306	20	None	Candidate Endangered	G3	S1	null	IUCN_VU-Vulnerable, USFS_S-Sensitive	null
Branchinecta longiantenna	longhorn fairy shrimp	Crustaceans	ICBRA03020	23	2	Endangered	None	G1	S2	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	796	19	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Branchinecta mesovallensis	midvalley fairy shrimp	Crustaceans	ICBRA03150	144	3	None	None	G2	S2S3	null	null	Vernal pool, Wetland
Branta hutchinsii leucopareia	cackling (=Aleutian Canada) goose	Birds	ABNJB05035	19	1	Delisted	None	G5T3	S3	null	CDFW_WL-Watch List	Artificial standing waters, Sacramento/San Joaquin standing waters, Valley & foothill grassland
Buteo regalis	ferruginous hawk	Birds	ABNKC19120	107	2	None	None	G4	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Great Basin grassland, Great Basin scrub, Pinon & juniper woodlands, Valley & foothill grassland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2561	41	None	Threatened	G5	S3	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Great Basin grassland, Riparian forest, Riparian woodland, Valley & foothill grassland
Calochortus pulchellus	Mt. Diablo fairy-lantern	Monocots	PMLIL0D160	52	50	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Riparian woodland, Valley & foothill grassland
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	Dicots	PDCON040D2	42	1	None	None	G4T2T3	S2S3	1B.2	BLM_S-Sensitive, SB_UCSC-UC Santa Cruz	Coastal bluff scrub, Coastal dunes, Coastal scrub, North coast coniferous forest
Campanula exigua	chaparral harebell	Dicots	PDCAM020A0	50	5	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Ultramafic
Carex comosa	bristly sedge	Monocots	PMCYP032Y0	31	1	None	None	G5	S2	2B.1	IUCN_LC-Least Concern	Coastal prairie, Freshwater marsh, Marsh & swamp, Valley & foothill grassland, Wetland
Centromadia parryi ssp. congdonii	Congdon's tarplant	Dicots	PDAST4R0P1	96	22	None	None	G3T2	S2	1B.1	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Valley & foothill grassland
Chloropyron molle ssp. molle	soft salty bird's-beak	Dicots	PDSCR0J0D2	27	6	Endangered	Rare	G2T1	S1	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Marsh & swamp, Salt marsh, Wetland
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Dicots	PDAPI0M051	17	4	None	None	G5T4T5	S2?	2B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Marsh & swamp, Salt marsh, Wetland

Circus hudsonius	northern harrier	Birds	ABNKC11011	54	2	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal scrub, Great Basin grassland, Marsh & swamp, Riparian scrub, Valley & foothill grassland, Wetland
Cirsium andrewsii	Franciscan thistle	Dicots	PDAST2E050	31	2	None	None	G3	S3	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub, Ultramafic
Cismontane Alkali Marsh	Cismontane Alkali Marsh	Marsh	CTT52310CA	4	1	None	None	G1	S1.1	null	null	Marsh & swamp, Wetland
Coastal Brackish Marsh	Coastal Brackish Marsh	Marsh	CTT52200CA	30	5	None	None	G2	S2.1	null	null	Marsh & swamp, Wetland
Coastal and Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh	Marsh	CTT52410CA	60	2	None	None	G3	S2.1	null	null	Marsh & swamp, Wetland
Coelus gracilis	San Joaquin dune beetle	Insects	IICOL4A020	11	1	None	None	G1	S1	null	BLM_S-Sensitive, IUCN_VU-Vulnerable	Interior dunes
Cordylanthus nidularius	Mt. Diablo bird's-beak	Dicots	PDSCR0J0F0	2	2	None	Rare	G1	S1	1B.1	SB_UCBG-UC Botanical Garden at Berkeley	Chaparral, Ultramafic
Corynorhinus townsendii	Townsend's big-eared bat	Mammals	AMACC08010	635	4	None	None	G4	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive	Broadleaved upland forest, Chaparral, Chenopod scrub, Great Basin grassland, Great Basin scrub, Joshua tree woodland, Lower montane coniferous forest, Meadow & seep, Mojavean desert scrub, Riparian forest, Riparian woodland, Sonoran desert scrub, Sonoran thorn woodland, Upper montane coniferous forest, Valley & foothill grassland
Coturnicops noveboracensis	yellow rail	Birds	ABNME01010	45	1	None	None	G4	S1S2	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, NABCI_RWL-Red Watch List, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Meadow & seep
Cryptantha hooveri	Hoover's cryptantha	Dicots	PDBOR0A190	4	1	None	None	GH	SH	1A	null	Interior dunes, Valley & foothill grassland
Danaus plexippus plexippus pop. 1	monarch - California overwintering population	Insects	IILEPP2012	389	2	Candidate	None	G4T1T2Q	S2	null	IUCN_EN-Endangered, USFS_S-Sensitive	Closed-cone coniferous forest
Delphinium californicum ssp. interius	Hospital Canyon larkspur	Dicots	PDRAN0B0A2	28	6	None	None	G3T3	S3	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Meadow & seep
Delphinium recurvatum	recurved larkspur	Dicots	PDRAN0B1J0	119	3	None	None	G2?	S2?	1B.2	BLM_S-Sensitive, SB_SBBG-Santa Barbara Botanic Garden	Chenopod scrub, Cismontane woodland, Valley & foothill grassland
Dipodomys heermanni berkeleyensis	Berkeley kangaroo rat	Mammals	AMAFD03061	8	5	None	None	G4T1	S2	null	null	Chaparral, Cismontane woodland

Dirca occidentalis	western leatherwood	Dicots	PDTHY03010	90	24	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Chaparral, Cismontane woodland, Closed-cone coniferous forest, North coast coniferous forest, Riparian forest, Riparian woodland
Efferia antiochi	Antioch efferian robberfly	Insects	IIDIP07010	4	2	None	None	G1G2	S1S2	null	null	Interior dunes
Egretta thula	snowy egret	Birds	ABNGA06030	20	1	None	None	G5	S4	null	IUCN_LC-Least Concern	Marsh & swamp, Meadow & seep, Riparian forest, Riparian woodland, Wetland
Elanus leucurus	white-tailed kite	Birds	ABNKC06010	184	8	None	None	G5	S3S4	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern	Cismontane woodland, Marsh & swamp, Riparian woodland, Valley & foothill grassland, Wetland
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1424	61	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Eremophila alpestris actia	California horned lark	Birds	ABPAT02011	94	2	None	None	G5T4Q	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marine intertidal & splash zone communities, Meadow & seep
Eriastrum ertterae	Lime Ridge eriastrum	Dicots	PDPLM030F0	2	2	None	Candidate Endangered	G1	S1	1B.1	null	Chaparral
Eriogonum nudum var. psychicola	Antioch Dunes buckwheat	Dicots	PDPGN0849Q	1	1	None	None	G5T1	S1	1B.1	null	Interior dunes
Eriogonum truncatum	Mt. Diablo buckwheat	Dicots	PDPGN085Z0	7	6	None	None	G1	S1	1B.1	SB_UCBG-UC Botanical Garden at Berkeley	Chaparral, Coastal scrub, Valley & foothill grassland
Eryngium jepsonii	Jepson's coyote-thistle	Dicots	PDAPI0Z130	19	7	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Valley & foothill grassland, Vernal pool
Eryngium racemosum	Delta button-celery	Dicots	PDAPI0Z0S0	26	1	None	Endangered	G1	S1	1B.1	null	Riparian scrub, Wetland
Eryngium spinosepalum	spiny-sepaled button-celery	Dicots	PDAPI0Z0Y0	108	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_SBBG-Santa Barbara Botanic Garden	Valley & foothill grassland, Vernal pool, Wetland
Erysimum capitatum var. angustatum	Contra Costa wallflower	Dicots	PDBRA16052	4	4	Endangered	Endangered	G5T1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Interior dunes
Eschscholzia rhombipetala	diamond-petaled California poppy	Dicots	PDPAP0A0D0	12	2	None	None	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley	Valley & foothill grassland
Eucerceris ruficeps	redheaded sphecid wasp	Insects	IIHYM18010	4	2	None	None	G1G3	S2	null	null	Interior dunes

Euphydryas editha bayensis	Bay checkerspot butterfly	Insects	IILEPK4055	30	1	Threatened	None	G5T1	S3	null	null	Coastal dunes, Ultramafic, Valley & foothill grassland
Extriplex joaquinana	San Joaquin spearscale	Dicots	PDCHE041F3	127	45	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland
Falco mexicanus	prairie falcon	Birds	ABNKD06090	451	6	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Falco peregrinus anatum	American peregrine falcon	Birds	ABNKD06071	73	1	Delisted	Delisted	G4T4	S3S4	null	CDF_S-Sensitive, CDFW_FP-Fully Protected	null
Fritillaria agrestis	stinkbells	Monocots	PMLIL0V010	32	7	None	None	G3	S3	4.2	null	Chaparral, Cismontane woodland, Pinon & juniper woodlands, Ultramafic, Valley & foothill grassland
Fritillaria liliacea	fragrant fritillary	Monocots	PMLIL0V0C0	82	8	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Cismontane woodland, Coastal prairie, Coastal scrub, Ultramafic, Valley & foothill grassland
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	Birds	ABPBX1201A	112	5	None	None	G5T3	S3	null	CDFW_SSC-Species of Special Concern, USFWS_BCC-Birds of Conservation Concern	Marsh & swamp
Gilia millefoliata	dark-eyed gilia	Dicots	PDPLM04130	54	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Coastal dunes
Gonidea angulata	western ridged mussel	Mollusks	IMBIV19010	157	1	None	None	G3	S2	null	IUCN_VU-Vulnerable	Aquatic
Grimmia torenii	Toren's grimmia	Bryophytes	NBMUS32330	13	2	None	None	G2	S2	1B.3	BLM_S-Sensitive	Chaparral, Cismontane woodland, Limestone, Lower montane coniferous forest
Haliaeetus leucocephalus	bald eagle	Birds	ABNKC10010	332	1	Delisted	Endangered	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive	Lower montane coniferous forest, Oldgrowth
Helianthella castanea	Diablo helianthella	Dicots	PDAST4M020	107	96	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Helminthoglypta nickliniana bridgesi	Bridges' coast range shoulderband	Mollusks	IMGASC2362	6	6	None	None	G3T1	S1S2	null	IUCN_DD-Data Deficient	Valley & foothill grassland
Hesperolinon breweri	Brewer's western flax	Dicots	PDLIN01030	29	21	None	None	G2	S2	1B.2	null	Chaparral, Cismontane woodland, Ultramafic, Valley & foothill grassland
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Dicots	PDMAL0H0R3	173	36	None	None	G5T3	S3	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley	Freshwater marsh, Marsh & swamp, Wetland

Hoita strobilina	Loma Prieta hoita	Dicots	PDFAB5Z030	37	2	None	None	G2?	S2?	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Riparian woodland, Ultramafic
Holocarpha macradenia	Santa Cruz tarplant	Dicots	PDAST4X020	37	13	Threatened	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley	Coastal prairie, Coastal scrub, Valley & foothill grassland
Hydroprogne caspia	Caspian tern	Birds	ABNNM08020	3	1	None	None	G5	S4	null	IUCN_LC-Least Concern	null
Hygrotus curvipes	curved-foot hygrotus diving beetle	Insects	IICOL38030	21	11	None	None	G2	S2	null	null	Aquatic
Hypomesus transpacificus	Delta smelt	Fish	AFCHB01040	29	8	Threatened	Endangered	G1	S1	null	AFS_TH-Threatened, IUCN_CR-Critically Endangered	Aquatic, Estuary
Idiostatus middlekauffi	Middlekauff's shieldback katydid	Insects	IIORT31010	1	1	None	None	G1G2	S1	null	IUCN_CR-Critically Endangered	Interior dunes
Isocoma arguta	Carquinez goldenbush	Dicots	PDAST57050	14	1	None	None	G1	S1	1B.1	SB_UCBG-UC Botanical Garden at Berkeley	Valley & foothill grassland
Lanius ludovicianus	loggerhead shrike	Birds	ABPBR01030	110	1	None	None	G4	S4	null	CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Broadleaved upland forest, Desert wash, Joshua tree woodland, Mojavean desert scrub, Pinon & juniper woodlands, Riparian woodland, Sonoran desert scrub
Lasionycteris noctivagans	silver-haired bat	Mammals	AMACC02010	139	1	None	None	G3G4	S3S4	null	IUCN_LC-Least Concern	Lower montane coniferous forest, Oldgrowth, Riparian forest
Lasiurus cinereus	hoary bat	Mammals	AMACC05032	238	3	None	None	G3G4	S4	null	IUCN_LC-Least Concern	Broadleaved upland forest, Cismontane woodland, Lower montane coniferous forest, North coast coniferous forest
Lasiurus frantzii	western red bat	Mammals	AMACC05080	128	1	None	None	G4	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Cismontane woodland, Lower montane coniferous forest, Riparian forest, Riparian woodland
Lasthenia conjugens	Contra Costa goldfields	Dicots	PDAST5L040	36	4	Endangered	None	G1	S1	1B.1	SB_UCBG-UC Botanical Garden at Berkeley	Alkali playa, Cismontane woodland, Valley & foothill grassland, Vernal pool, Wetland
Laterallus jamaicensis coturniculus	California black rail	Birds	ABNME03041	303	30	None	Threatened	G3T1	S1	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_EN-Endangered, NABCI_RWL-Red Watch List	Brackish marsh, Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
Lathyrus jepsonii var. jepsonii	Delta tule pea	Dicots	PDFAB250D2	133	27	None	None	G5T2	S2	1B.2	SB_BerrySB-Berry Seed Bank, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Freshwater marsh, Marsh & swamp, Wetland
Lepidurus packardi	vernal pool tadpole shrimp	Crustaceans	ICBRA10010	329	1	Endangered	None	G4	S3	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland

Lilaeopsis masonii	Mason's lilaeopsis	Dicots	PDAPI19030	198	69	None	Rare	G2	S2	1B.1	null	Freshwater marsh, Marsh & swamp, Riparian scrub, Wetland
Limosella australis	Delta mudwort	Dicots	PDSCR10030	59	18	None	None	G4G5	S2	2B.1	null	Brackish marsh, Freshwater marsh, Marsh & swamp, Riparian scrub, Wetland
Linderiella occidentalis	California linderiella	Crustaceans	ICBRA06010	508	11	None	None	G2G3	S2S3	null	IUCN_NT-Near Threatened	Vernal pool
Lytta molesta	molestan blister beetle	Insects	IICOL4C030	17	2	None	None	G2	S2	null	null	Vernal pool, Wetland
Madia radiata	showy golden madia	Dicots	PDAST650E0	100	2	None	None	G3	S3	1B.1	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Cismontane woodland, Valley & foothill grassland
Malacothamnus hallii	Hall's bush-mallow	Dicots	PDMAL0Q0F0	46	8	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Coastal scrub, Ultramafic
Masticophis flagellum ruddocki	San Joaquin coachwhip	Reptiles	ARADB21021	96	1	None	None	G5T2T3	S3	null	CDFW_SSC-Species of Special Concern	Chenopod scrub, Valley & foothill grassland
Masticophis lateralis euryxanthus	Alameda whipsnake	Reptiles	ARADB21031	167	97	Threatened	Threatened	G4T2	S2	null	null	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Meconella oregana	Oregon meconella	Dicots	PDPAP0G030	9	4	None	None	G2G3	S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Coastal prairie, Coastal scrub
Melospiza melodia maxillaris	Suisun song sparrow	Birds	ABPBXA301K	36	14	None	None	G5T3	S3	null	CDFW_SSC-Species of Special Concern	Marsh & swamp, Wetland
Melospiza melodia pop. 1	song sparrow ("Modesto" population)	Birds	ABPBXA3013	92	14	None	None	G5T3?Q	S3?	null	CDFW_SSC-Species of Special Concern	Artificial flowing waters, Freshwater marsh, Riparian forest, Riparian scrub, Riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters
Melospiza melodia pusillula	Alameda song sparrow	Birds	ABPBXA301S	38	3	None	None	G5T2T3	S2S3	null	CDFW_SSC-Species of Special Concern, USFWS_BCC-Birds of Conservation Concern	Salt marsh
Melospiza melodia samuelis	San Pablo song sparrow	Birds	ABPBXA301W	41	6	None	None	G5T2	S2	null	CDFW_SSC-Species of Special Concern, USFWS_BCC-Birds of Conservation Concern	Salt marsh
Metapogon hurdi	Hurd's metapogon robberfly	Insects	IIDIP08010	3	1	None	None	G1G2	S1S2	null	null	Interior dunes
Microtus californicus sanpabloensis	San Pablo vole	Mammals	AMAFF11034	8	8	None	None	G5T1T2	S1S2	null	CDFW_SSC-Species of Special Concern	Marsh & swamp, Valley & foothill grassland, Wetland
Monolopia gracilens	woodland woollythreads	Dicots	PDAST6G010	68	8	None	None	G3	S3	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Chaparral, Cismontane woodland, North coast coniferous forest, Ultramafic, Valley & foothill grassland

Myrmosula pacifica	Antioch multilid wasp	Insects	IIHYM15010	4	1	None	None	GH	SH	null	null	Interior dunes
Nannopterum auritum	double-crested cormorant	Birds	ABNFD01020	39	1	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Riparian forest, Riparian scrub, Riparian woodland
Navarretia gowenii	Lime Ridge navarretia	Dicots	PDPLM0C120	3	2	None	None	G1	S1	1B.1	SB_UCBG-UC Botanical Garden at Berkeley	Chaparral
Navarretia nigelliformis ssp. radians	shining navarretia	Dicots	PDPLM0C0J2	102	3	None	None	G4T2	S2	1B.2	BLM_S-Sensitive	Cismontane woodland, Valley & foothill grassland, Vernal pool, Wetland
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	Mammals	AMAFF08082	42	5	None	None	G5T2T3	S2S3	null	CDFW_SSC-Species of Special Concern	Chaparral, Redwood
Northern Claypan Vernal Pool	Northern Claypan Vernal Pool	Herbaceous	CTT44120CA	21	1	None	None	G1	S1.1	null	null	Vernal pool, Wetland
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	Marsh	CTT52110CA	53	6	None	None	G3	S3.2	null	null	Marsh & swamp, Wetland
Northern Maritime Chaparral	Northern Maritime Chaparral	Scrub	CTT37C10CA	17	3	None	None	G1	S1.2	null	null	Chaparral
Nycticorax nycticorax	black-crowned night heron	Birds	ABNGA11010	37	1	None	None	G5	S4	null	IUCN_LC-Least Concern	Marsh & swamp, Riparian forest, Riparian woodland, Wetland
Nyctinomops macrotis	big free-tailed bat	Mammals	AMACD04020	32	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	null
Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	Dicots	PDONA0C0B4	10	9	Endangered	Endangered	G5T1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley	Interior dunes
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	Fish	AFCHA0209K	31	2	Threatened	None	G5T2Q	S2	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
Pandion haliaetus	osprey	Birds	ABNKC01010	504	3	None	None	G5	S4	null	CDF_S-Sensitive, CDFW_WL-Watch List, IUCN_LC-Least Concern	Riparian forest
Perdita scitula antiochensis	Antioch andrenid bee	Insects	IIHYM01031	2	2	None	None	G1T1	S2	null	null	Interior dunes
Perognathus inornatus	San Joaquin pocket mouse	Mammals	AMAFD01060	140	6	None	None	G2G3	S2S3	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Cismontane woodland, Mojavean desert scrub, Valley & foothill grassland
Phacelia phacelioides	Mt. Diablo phacelia	Dicots	PDHYD0C3Q0	16	6	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Ultramafic
Philanthus nasalis	Antioch specid wasp	Insects	IIHYM20010	4	1	None	None	G2	S2	null	null	Interior dunes
Phrynosoma blainvillii	coast horned lizard	Reptiles	ARACF12100	784	4	None	None	G3	S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Chaparral, Cismontane woodland, Coastal bluff scrub, Coastal scrub, Desert wash, Pinon & juniper woodlands, Riparian scrub, Riparian woodland, Valley & foothill grassland
Polygonum marinense	Marin knotweed	Dicots	PDPGN0L1C0	32	1	None	None	G2Q	S2	3.1	null	Brackish marsh, Marsh & swamp, Salt marsh, Wetland

Pomatiopsis californica	Pacific walker	Mollusks	IMGASJ9020	4	1	None	None	G1	S1	null	IUCN_DD-Data Deficient	null
Potamogeton zosteriformis	eel-grass pondweed	Monocots	PMPOT03160	20	1	None	None	G5	S3	2B.2	null	Marsh & swamp, Wetland
Puccinellia simplex	California alkali grass	Monocots	PMPOA53110	80	4	None	None	G2	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool
Rallus obsoletus obsoletus	California Ridgway's rail	Birds	ABNME05011	99	12	Endangered	Endangered	G3T1	S1	null	CDFW_FP-Fully Protected, NABCI_RWL-Red Watch List	Brackish marsh, Marsh & swamp, Salt marsh, Wetland
Rana boylii pop. 4	foothill yellow-legged frog - central coast DPS	Amphibians	AAABH01054	178	9	Proposed Threatened	Endangered	G3T2	S2	null	BLM_S-Sensitive, USFS_S-Sensitive	Aquatic, Riparian forest, Riparian scrub, Riparian woodland, South coast flowing waters
Rana draytonii	California red-legged frog	Amphibians	AAABH01022	1685	210	Threatened	None	G2G3	S2S3	null	CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable	Aquatic, Artificial flowing waters, Artificial standing waters, Freshwater marsh, Marsh & swamp, Riparian forest, Riparian scrub, Riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Reithrodontomys raviventris	salt-marsh harvest mouse	Mammals	AMAFF02040	144	9	Endangered	Endangered	G1G2	S1S2	null	CDFW_FP-Fully Protected, IUCN_EN-Endangered	Marsh & swamp, Wetland
Rhaphiomidas trochilus	San Joaquin Valley giant flower-loving fly	Insects	IIDIP05010	6	1	None	None	G1	S1	null	null	Interior dunes
Sanicula saxatilis	rock sanicle	Dicots	PDAPI1Z0H0	9	4	None	Rare	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Chaparral, Valley & foothill grassland
Scutellaria galericulata	marsh skullcap	Dicots	PDLAM1U0J0	39	1	None	None	G5	S2	2B.2	null	Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Wetland
Senecio aphanactis	chaparral ragwort	Dicots	PDAST8H060	98	2	None	None	G3	S2	2B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	Chaparral, Cismontane woodland, Coastal scrub
Serpentine Bunchgrass	Serpentine Bunchgrass	Herbaceous	CTT42130CA	22	3	None	None	G2	S2.2	null	null	Valley & foothill grassland
Sorex vagrans halicoetes	salt-marsh wandering shrew	Mammals	AMABA01071	12	2	None	None	G5T1	S1	null	CDFW_SSC-Species of Special Concern	Marsh & swamp, Wetland
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Dicots	PDCAR0W062	22	10	None	None	G5T2	S2	1B.2	null	Marsh & swamp, Meadow & seep
Sphecodogastra antiochensis	Antioch Dunes halcitid bee	Insects	IIHYM78010	1	1	None	None	G1	S1	null	null	Interior dunes
Spirinchus thaleichthys	longfin smelt	Fish	AFCHB03010	46	10	Candidate	Threatened	G5	S1	null	IUCN_LC-Least Concern	Aquatic, Estuary
Stabilized Interior Dunes	Stabilized Interior Dunes	Dune	CTT23100CA	2	1	None	None	G1	S1.1	null	null	Interior dunes
Sternula antillarum browni	California least tern	Birds	ABNNM08103	75	2	Endangered	Endangered	G4T2T3Q	S2	null	CDFW_FP-Fully Protected,	Alkali playa, Wetland

											NABCI_RWL-Red Watch List	
Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	Dicots	PDBRA2G012	103	5	None	None	G2T2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley, USFS_S-Sensitive	Chaparral, Cismontane woodland, Ultramafic, Valley & foothill grassland
Streptanthus hispidus	Mt. Diablo jewelflower	Dicots	PDBRA2G0M0	8	8	None	None	G2	S2	1B.3	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Valley & foothill grassland
Stuckenia filiformis ssp. alpina	northern slender pondweed	Monocots	PMPOT03091	21	2	None	None	G5T5	S2S3	2B.2	null	Marsh & swamp, Wetland
Suaeda californica	California seablite	Dicots	PDCHE0P020	18	1	Endangered	None	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Freshwater marsh, Marsh & swamp, Wetland
Symphyotrichum lentum	Suisun Marsh aster	Dicots	PDASTE8470	175	35	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_USDA-US Dept of Agriculture	Brackish marsh, Freshwater marsh, Marsh & swamp, Wetland
Taxidea taxus	American badger	Mammals	AMAJF04010	594	11	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes, Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, Ione formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain, Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Thaleichthys pacificus	eulachon	Fish	AFCHB04010	10	2	Threatened	None	G5	S1	null	IUCN_LC-Least Concern	Aquatic, Klamath/North

												coast flowing waters
Thamnophis gigas	giant gartersnake	Reptiles	ARADB36150	373	5	Threatened	Threatened	G2	S2	null	IUCN_VU-Vulnerable	Marsh & swamp, Riparian scrub, Wetland
Trifolium hydrophilum	saline clover	Dicots	PDFAB400R5	56	2	None	None	G2	S2	1B.2	null	Marsh & swamp, Valley & foothill grassland, Vernal pool, Wetland
Triquetrella californica	coastal triquetrella	Bryophytes	NBMUS7S010	13	1	None	None	G2	S2	1B.2	USFS_S-Sensitive	Coastal bluff scrub, Coastal scrub
Tropidocarpum capparideum	caper-fruited tropidocarpum	Dicots	PDBRA2R010	20	5	None	None	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Valley & foothill grassland
Valley Needlegrass Grassland	Valley Needlegrass Grassland	Herbaceous	CTT42110CA	45	3	None	None	G3	S3.1	null	null	Valley & foothill grassland
Valley Sink Scrub	Valley Sink Scrub	Scrub	CTT36210CA	29	2	None	None	G1	S1.1	null	null	Chenopod scrub
Viburnum ellipticum	oval-leaved viburnum	Dicots	PDCPR07080	39	6	None	None	G4G5	S3?	2B.3	null	Chaparral, Cismontane woodland, Lower montane coniferous forest
Vulpes macrotis mutica	San Joaquin kit fox	Mammals	AMAJA03041	1020	24	Endangered	Threatened	G4T2	S2	null	null	Chenopod scrub, Valley & foothill grassland
Xanthocephalus xanthocephalus	yellow-headed blackbird	Birds	ABPBXB3010	13	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Marsh & swamp, Wetland

CNPS Rare Plant Inventory

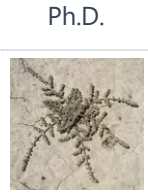
California Native Plant Society

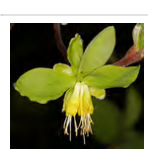
Search Results

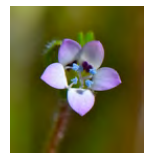
97 matches found. Click on scientific name for details

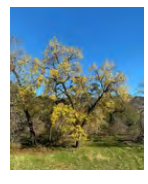
Search Criteria: CRPR is one of [**1A:1B:2A:2B:3:4**] , County or Island is one of [**CCA**]

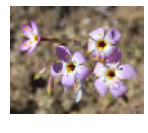
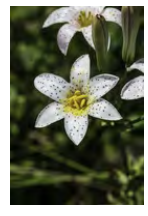
▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Amsinckia grandiflora	large-flowered fiddleneck	Boraginaceae	annual herb	(Mar)Apr-May	FE	CE	G1	S1	1B.1	Yes	1974-01-01	 © 2015 Zoya Akulova
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	None	None	G3	S3	1B.2	Yes	1974-01-01	 © 2011 Neal Kramer
Androsace elongata ssp. *acuta*	California androsace	Primulaceae	annual herb	Mar-Jun	None	None	G5?T3T4	S3S4	4.2		1994-01-01	 © 2008 Aaron Schusteff
Anomobryum julaceum	slender silver moss	Bryaceae	moss		None	None	G5?	S2	4.2		2001-01-01	 © 2013 Scot Loring
Arabis blepharophylla	coast rockcress	Brassicaceae	perennial herb	Feb-May	None	None	G4	S4	4.3	Yes	1974-01-01	 © 2011 Neal Kramer
Arctostaphylos auriculata	Mt. Diablo manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar	None	None	G2	S2	1B.3	Yes	1974-01-01	 © 2006 Steve Matson
Arctostaphylos manzanita ssp. *laevigata*	Contra Costa manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar(Apr)	None	None	G5T2	S2	1B.2	Yes	1984-01-01	 © 2019 Susan McDougall
Arctostaphylos pallida	pallid manzanita	Ericaceae	perennial evergreen shrub	Dec-Mar	FT	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available

Astragalus tener var. *tener*	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	Yes	1994-01-01	No Photo Available
Atriplex cordulata var. *cordulata*	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G3T2	S2	1B.2	Yes	1988-01-01	 © 1994 Robert E. Preston, Ph.D.
Atriplex coronata var. *coronata*	crownscale	Chenopodiaceae	annual herb	Mar-Oct	None	None	G4T3	S3	4.2	Yes	1994-01-01	 © 1994 Robert E. Preston, Ph.D.
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1994-01-01	 © 2009 Zoya Akulova
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	None	None	G1G2	S1S2	1B.1	Yes	1994-01-01	No Photo Available
Calandrinia breweri	Brewer's calandrinia	Montiaceae	annual herb	(Jan)Mar-Jun	None	None	G4	S4	4.2		1994-01-01	No Photo Available
Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Calochortus umbellatus	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	Mar-May	None	None	G3?	S3?	4.2	Yes	1980-01-01	No Photo Available
Calystegia purpurata ssp. *saxicola*	coastal bluff morning-glory	Convolvulaceae	perennial herb	(Mar)Apr-Sep	None	None	G4T2T3	S2S3	1B.2	Yes	2001-01-01	No Photo Available
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1		1994-01-01	 Dean Wm. Taylor 1997
Castilleja ambigua var. *ambigua*	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	Mar-Aug	None	None	G4T4	S3S4	4.2		2009-02-04	 ©2011 Dylan Neubauer
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	None	None	G3T2	S2	1B.1	Yes	1994-01-01	No Photo Available

Chloropyron molle ssp. *molle*	soft salty bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Nov	FE	CR	G2T1	S1	1B.2	Yes	1974-01-01	No Photo Available
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	None	None	G5T4T5	S2?	2B.1		1974-01-01	No Photo Available
Cirsium andrewsii	Franciscan thistle	Asteraceae	perennial herb	Mar-Jul	None	None	G3	S3	1B.2	Yes	1974-01-01	No Photo Available
Collomia diversifolia	serpentine collomia	Polemoniaceae	annual herb	May-Jun	None	None	G4	S4	4.3	Yes	1974-01-01	 ©2019 Zoya Akulova
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	None	None	G4	S4	4.2		1994-01-01	No Photo Available
Cordylanthus nidularius	Mt. Diablo bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Aug	None	CR	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Cryptantha hooveri	Hoover's cryptantha	Boraginaceae	annual herb	Apr-May	None	None	GH	SH	1A	Yes	1974-01-01	No Photo Available
Delphinium californicum ssp. *interius*	Hospital Canyon larkspur	Ranunculaceae	perennial herb	Apr-Jun	None	None	G3T3	S3	1B.2	Yes	1984-01-01	No Photo Available
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	None	None	G2?	S2?	1B.2	Yes	1988-01-01	No Photo Available
Dirca occidentalis	western leatherwood	Thymelaeaceae	perennial deciduous shrub	Jan-Mar(Apr)	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2017 Steve Matson
Eleocharis parvula	small spikerush	Cyperaceae	perennial herb	(Apr)Jun-Aug(Sep)	None	None	G5	S3	4.3		1980-01-01	 ©2018 Ron Vanderhoff
Eriastrum ertterae	Lime Ridge eriastrum	Polemoniaceae	annual herb	Jun-Jul	None	CC	G1	S1	1B.1	Yes	2013-12-19	 © 2013 John Doyen
Eriogonum nudum var. *psychicola*	Antioch Dunes buckwheat	Polygonaceae	perennial herb	Jul-Oct	None	None	G5T1	S1	1B.1	Yes	2010-06-21	No Photo Available
Eriogonum truncatum	Mt. Diablo buckwheat	Polygonaceae	annual herb	Apr-Sep(Nov-Dec)	None	None	G1	S1	1B.1	Yes	1974-01-01	No Photo Available

Eriogonum umbellatum var. *bahiiforme*	bay buckwheat	Polygonaceae	perennial herb	Jul-Sep	None	None	G5T3	S3	4.2	Yes	2001-01-01	No Photo Available
Eriophyllum jepsonii	Jepson's woolly sunflower	Asteraceae	perennial herb	Apr-Jun	None	None	G3	S3	4.3	Yes	1974-01-01	No Photo Available
Eryngium jepsonii	Jepson's coyote-thistle	Apiaceae	perennial herb	Apr-Aug	None	None	G2	S2	1B.2	Yes	2016-09-13	No Photo Available
Eryngium racemosum	Delta button-celery	Apiaceae	annual/perennial herb	(May)Jun-Oct	None	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual/perennial herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	1980-01-01	No Photo Available
Erysimum capitatum var. *angustatum*	Contra Costa wallflower	Brassicaceae	perennial herb	Mar-Jul	FE	CE	G5T1	S1	1B.1	Yes	1974-01-01	No Photo Available
Erythranthe inconspicua	small-flowered monkeyflower	Phrymaceae	annual herb	May-Jun	None	None	G4	S4	4.3	Yes	1974-01-01	 © 2017 Debra L. Cook
Eschscholzia rhombipetala	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	None	None	G1	S1	1B.1	Yes	1980-01-01	No Photo Available
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1988-01-01	No Photo Available
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	G3	S3	4.2	Yes	1980-01-01	 © 2016 Aaron Schusteff
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2004 Carol W. Witham
Galium andrewsii ssp. *gatense*	phlox-leaf serpentine bedstraw	Rubiaceae	perennial herb	Apr-Jul	None	None	G5T3	S3	4.2	Yes	1994-01-01	 © 2021 Steve Matson
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	Apr-Jul	None	None	G2	S2	1B.2		2001-01-01	 © 2017 John Doyen

Grimmia torenii	Toren's grimmia	Grimmiaceae	moss		None	None	G2	S2	1B.3	Yes	2014-05-14	 ©2021 Scot Loring
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2013 Christopher Bronny
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	Yes	2001-01-01	 © 2017 John Doyen
Hesperolinon breweri	Brewer's western flax	Linaceae	annual herb	May-Jul	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2014 Neal Kramer
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	Yes	1974-01-01	 © 2020 Steven Perry
Hoita strobilina	Loma Prieta hoita	Fabaceae	perennial herb	May-Jul(Aug-Oct)	None	None	G2?	S2?	1B.1	Yes	2001-01-01	 © 2004 Janell Hillman
Holocarpha macradenia	Santa Cruz tarplant	Asteraceae	annual herb	Jun-Oct	FT	CE	G1	S1	1B.1	Yes	1974-01-01	 © 2011 Dylan Neubauer
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb	Mar-May(Jun)	None	None	G3	S3	4.2	Yes	2006-10-12	 © 2014 Aaron Schusteff
Isocoma arguta	Carquinez goldenbush	Asteraceae	perennial shrub	Aug-Dec	None	None	G1	S1	1B.1	Yes	1994-01-01	No Photo Available
Juglans californica	Southern California black walnut	Juglandaceae	perennial deciduous tree	Mar-Aug	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2020 Zoya Akulova

Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	FE	None	G1	S1	1B.1	Yes	1974-01-01	 © 2013 Neal Kramer
Lasthenia ferrisiae	Ferris' goldfields	Asteraceae	annual herb	Feb-May	None	None	G3	S3	4.2	Yes	2001-01-01	 © 2009 Zoya Akulova
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	Yes	1974-01-01	 © 2003 Mark Fogiel
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2010 Aaron Schusteff
Leptosiphon grandiflorus	large-flowered leptosiphon	Polemoniaceae	annual herb	Apr-Aug	None	None	G3G4	S3S4	4.2	Yes	1994-01-01	 © 2003 Doreen L. Smith
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	Yes	1974-01-01	No Photo Available
Lilium rubescens	redwood lily	Liliaceae	perennial bulbiferous herb	(Mar)Apr-Aug(Sep)	None	None	G3	S3	4.2	Yes	1974-01-01	 Gerald and Buff Corsi © 2022 California Academy of Sciences
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	None	None	G4G5	S2	2B.1		1994-01-01	 © 2020 Richard Sage
Lupinus albifrons var. *abramsii*	Abrams' lupine	Fabaceae	perennial herb	Apr-Jun	None	None	G5T3?Q	S3?	3.2	Yes	1974-01-01	No Photo Available
Madia radiata	showy golden madia	Asteraceae	annual herb	Mar-May	None	None	G3	S3	1B.1	Yes	1988-01-01	No Photo Available
Malacothamnus hallii	Hall's bush-mallow	Malvaceae	perennial deciduous shrub	(Apr)May-Sep(Oct)	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2017 Keir Morse

Meconella oregana	Oregon meconella	Papaveraceae	annual herb	Mar-Apr	None	None	G2G3	S2	1B.1		1974-01-01	 © 2021 Scot Loring
Microseris sylvatica	sylvan microseris	Asteraceae	perennial herb	Mar-Jun	None	None	G4	S4	4.2	Yes	2001-01-01	No Photo Available
Monardella antonina ssp. *antonina*	San Antonio Hills monardella	Lamiaceae	perennial rhizomatous herb	Jun-Aug	None	None	G4T1T3Q	S1S3	3	Yes	1980-01-01	No Photo Available
Monolopia gracilens	woodland woollythreads	Asteraceae	annual herb	(Feb)Mar-Jul	None	None	G3	S3	1B.2	Yes	2010-04-06	 © 2016 Richard Spellenberg
Myosurus minimus ssp. *apus*	little mousetail	Ranunculaceae	annual herb	Mar-Jun	None	None	G5T2Q	S2	3.1		1980-01-01	No Photo Available
Navarretia gowenii	Lime Ridge navarretia	Polemoniaceae	annual herb	May-Jun	None	None	G1	S1	1B.1	Yes	2008-05-15	No Photo Available
Navarretia heterandra	Tehama navarretia	Polemoniaceae	annual herb	Apr-Jun	None	None	G4	S4	4.3		1974-01-01	 ©2021 Scot Loring
Navarretia nigelliformis ssp. *radians*	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	None	None	G4T2	S2	1B.2	Yes	1994-01-01	No Photo Available
Oenothera deltoides ssp. *howellii*	Antioch Dunes evening-primrose	Onagraceae	perennial herb	Mar-Sep	FE	CE	G5T1	S1	1B.1	Yes	1974-01-01	No Photo Available
Phacelia phacelioides	Mt. Diablo phacelia	Hydrophyllaceae	annual herb	Apr-May	None	None	G2	S2	1B.2	Yes	1974-01-01	 ©2019 Steve Matson
Piperia michaelii	Michael's rein orchid	Orchidaceae	perennial herb	Apr-Aug	None	None	G3	S3	4.2	Yes	1984-01-01	No Photo Available
Polygonum marinense	Marin knotweed	Polygonaceae	annual herb	(Apr)May-Aug(Oct)	None	None	G2Q	S2	3.1	Yes	1974-01-01	No Photo Available
Potamogeton zosteriformis	eel-grass pondweed	Potamogetonaceae	annual herb (aquatic)	Jun-Jul	None	None	G5	S3	2B.2		1994-01-01	No Photo Available
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	None	None	G2	S2	1B.2		2015-10-15	No Photo Available

Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	None	None	G4	S3	4.2		1974-01-01	No Photo Available
Ravenella exigua	chaparral harebell	Campanulaceae	annual herb	May-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Sanicula saxatilis	rock sanicle	Apiaceae	perennial herb	Apr-May	None	CR	G2	S2	1B.2	Yes	1974-01-01	 © 1998 John Game
Scutellaria galericulata	marsh skullcap	Lamiaceae	perennial rhizomatous herb	Jun-Sep	None	None	G5	S2	2B.2		1994-01-01	 © 2021 Scot Loring
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	None	None	G3	S2	2B.2		1994-01-01	No Photo Available
Spergularia macrotheca var. *longistyla*	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May	None	None	G5T2	S2	1B.2	Yes	2017-06-16	No Photo Available
Streptanthus albidus ssp. *peramoenus*	most beautiful jewelflower	Brassicaceae	annual herb	(Mar)Apr-Sep(Oct)	None	None	G2T2	S2	1B.2	Yes	1988-01-01	 © 1994 Robert E. Preston, Ph.D.
Streptanthus hispidus	Mt. Diablo jewelflower	Brassicaceae	annual herb	Mar-Jun	None	None	G2	S2	1B.3	Yes	1974-01-01	 © 2011 Aaron Schusteff
Stuckenia filiformis ssp. *alpina*	northern slender pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	None	None	G5T5	S2S3	2B.2		1994-01-01	 Dana York (2016)
Suaeda californica	California seablite	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	FE	None	G1	S1	1B.1	Yes	1988-01-01	No Photo Available
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	2001-01-01	No Photo Available
Triquetrella californica	coastal triquetrella	Pottiaceae	moss		None	None	G2	S2	1B.2		2001-01-01	No Photo Available

Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	Mar-Apr	None	None	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Viburnum ellipticum	oval-leaved viburnum	Viburnaceae	perennial deciduous shrub	May-Jun	None	None	G4G5	S3?	2B.3		1974-01-01	 © 2006 Tom Engstrom

Showing 1 to 97 of 97 entries

Suggested Citation:
California Native Plant Society, Rare Plant Program. 2023. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 18 April 2023].

Appendix 5.5-1 Contra Costa County General Plan Update: Cultural Resources Existing Conditions Report

Appendices

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DRAFT

CONTRA COSTA COUNTY GENERAL PLAN UPDATE: CULTURAL RESOURCES EXISTING CONDITIONS REPORT

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JANUARY 2019



ICF. 2019. *Contra Costa County General Plan Update: Cultural Resources Existing Conditions Report*. Draft. January. (ICF 671.18.) San Francisco, CA. Prepared for Contra Costa County Department of Conservation and Development, Martinez, CA.

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Acronyms and Abbreviations

2005–2020 General Plan	Contra Costa County General Plan 2005–2020
cal BP	calibrated years before the present
Delta	Sacramento River–San Joaquin River Delta
Existing Conditions Report	Contra Costa County General Plan Update: Cultural Resources Existing Conditions Report
HLAC	Historic Landmarks Advisory Committee
HRI	Historic Resources Inventory
NWIC	Northwest Information Center

Chapter 1
Introduction

This *Contra Costa County General Plan Update: Cultural Resources Existing Conditions Report* (Existing Conditions Report) describes and maps existing cultural resources conditions in Contra Costa County. The county covers 513,569 acres and includes 19 incorporated cities and towns.

This Existing Conditions Report documents the following:

- Built historic resources
- Archaeological resources
- Tribal communities

This report is intended to support both preparation of the *Contra Costa County General Plan Update*, which will include a comprehensive review and update of *Contra Costa County General Plan 2005–2020* (2005–2020 General Plan), and analysis of impacts on existing cultural resources within the General Plan 2020 Environmental Impact Report.

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Chapter 2
Built Historic Resources

This chapter describes previously identified built historic resources located in the unincorporated areas of the county.

The 2005–2020 General Plan references a Historic Resources Inventory (HRI), the result of a 1976 collaboration between Contra Costa County local historical societies (Contra Costa County 2005). The HRI is the official approved list of historical resources within the unincorporated areas of the county.[1] The most recent update to the HRI was approved and published by the Contra Costa County Historic Landmarks Advisory Committee (HLAC) in 2016 (Contra Costa County 2016). The 2016 Draft HRI identifies a total of 376 built historic resources in the unincorporated areas of the county. Each built historic resource included in the HRI includes the following evaluation categories:

- Structure of Historical Significance,
- Architectural Specimen,
- Site of Historic Event,
- Site Relating to Important Person in History, and
- Building of Significance.

These terms, original to the 1976 Draft HRI, appear to align with the HLAC's designating criteria (Nelson pers. comm.).

Three additional built historic resources in the county were identified for inclusion in the HRI since publication of the 2016 Draft HRI. The Contra Costa County Board of Supervisors added the three resources to the HRI per resolution at a February 7, 2017, meeting.

One additional built historic resource in the county was identified for inclusion as a result of a records search conducted in December 2018 at the Northwest Information Center (NWIC). The 2018 updated records search was limited to properties documented in the county between 2016 and 2018 to capture any properties that were formally documented since publication of the 2016 Draft HRI.

There are 380 built historical resources in the unincorporated areas of the county, including the 376 built historic resources identified in the 2016 Draft HRI, three built historic resources added to the HRI by the Contra Costa Board of Supervisors, and one built historic resources identified in the 2018 updated records search. The built historic resources identified in the unincorporated areas of the county, which are included in the table in Appendix A and shown in Figure 2-1, are categorized as follows:

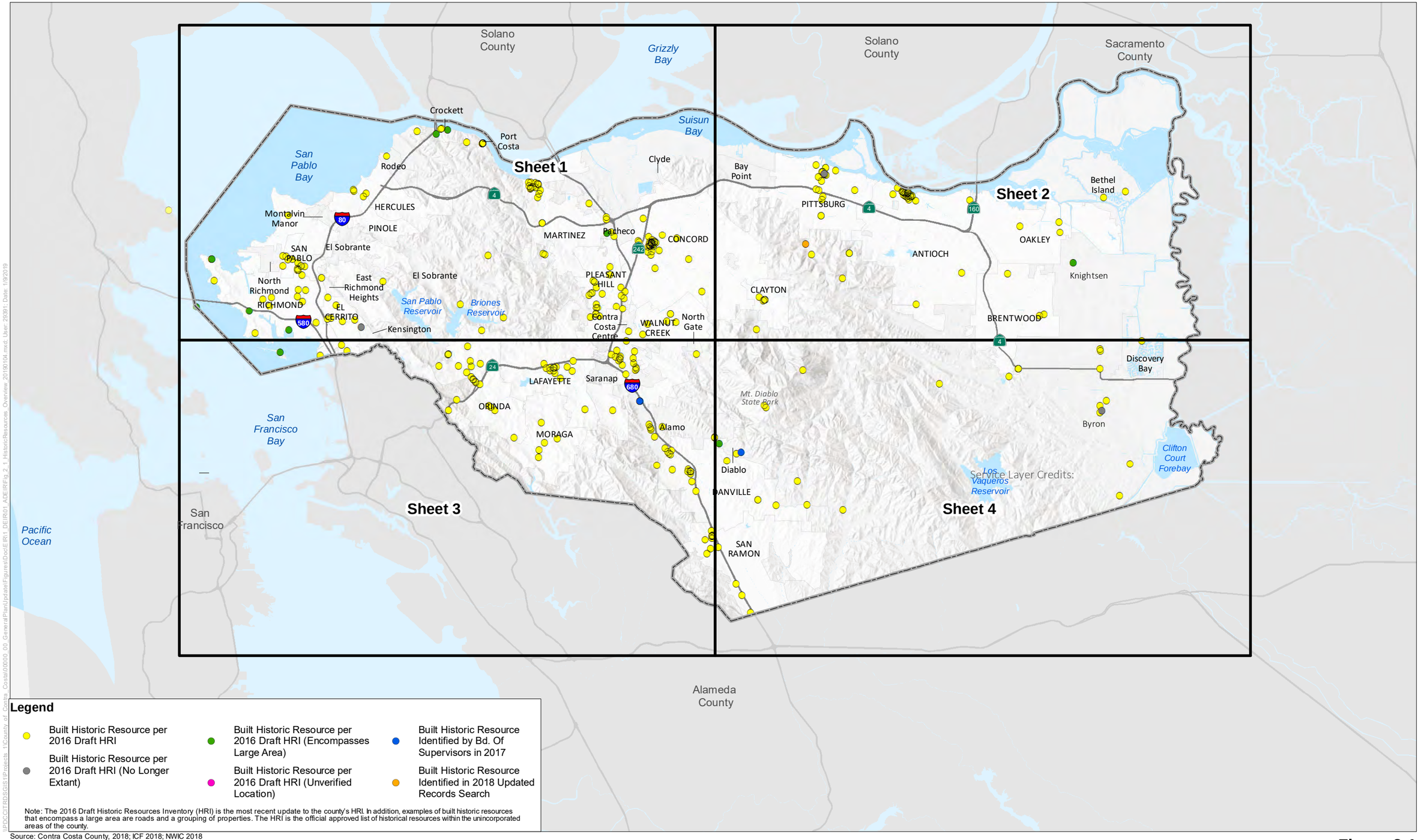
- The 376 resources identified in the 2016 Draft HRI (no color code in the table in Appendix A; color coded yellow in Figure 2-1);

[1] In some instances, older entries in the HRI include properties that have since been incorporated and therefore are noted as such in the HRI. Thus, not all resources identified in the HRI are located in unincorporated areas of the county.

- The 23 resources identified in the 2016 Draft HRI whose locations could not be verified and therefore were approximated (color coded pink);
- The three former structures of significance identified in the 2016 Draft HRI that are no longer extant[2] and now sites of significance (color coded grey);
- The 11 resources identified in the 2016 Draft HRI that encompass a larger area, such as a road or grouping of properties (color coded green);
- The three resources that were added by the HLAC subsequent to publication of the 2016 Draft HRI (color coded blue); and
- The one resource that was identified in the 2018 updated records search but has not yet been evaluated for inclusion in the HRI (color coded orange).

Development of the table in Appendix A and Figure 2-1, which relied on existing historic resource recordation, is intended to provide a baseline for the identification of resources in the unincorporated areas of the county and inform future planning and development decisions. A comprehensive inventory of all potentially eligible historic resources was not completed for this report. For cases in which prior evaluation has been completed or existing evaluations are out of date, age-eligible properties may require new or updated evaluations. New properties may be found to be eligible historic resources through the project-level environmental review process.

[2] Extant resources are still in existence.



Legend

- Built Historic Resource per 2016 Draft HRI
- Built Historic Resource per 2016 Draft HRI (Encompasses Large Area)
- Built Historic Resource Identified by Bd. Of Supervisors in 2017
- Built Historic Resource per 2016 Draft HRI (No Longer Extant)
- Built Historic Resource per 2016 Draft HRI (Unverified Location)
- Built Historic Resource Identified in 2018 Updated Records Search

Note: The 2016 Draft Historic Resources Inventory (HRI) is the most recent update to the county's HRI. In addition, examples of built historic resources that encompass a large area are roads and a grouping of properties. The HRI is the official approved list of historical resources within the unincorporated areas of the county.

Source: Contra Costa County, 2018; ICF 2018; NWIC 2018

0 2.5 5 10 Miles

N

Note: The following sheets provide a detailed map of each quadrant of the County.

Figure 2-1
Overview Map
Previously Identified Built Historic Resources

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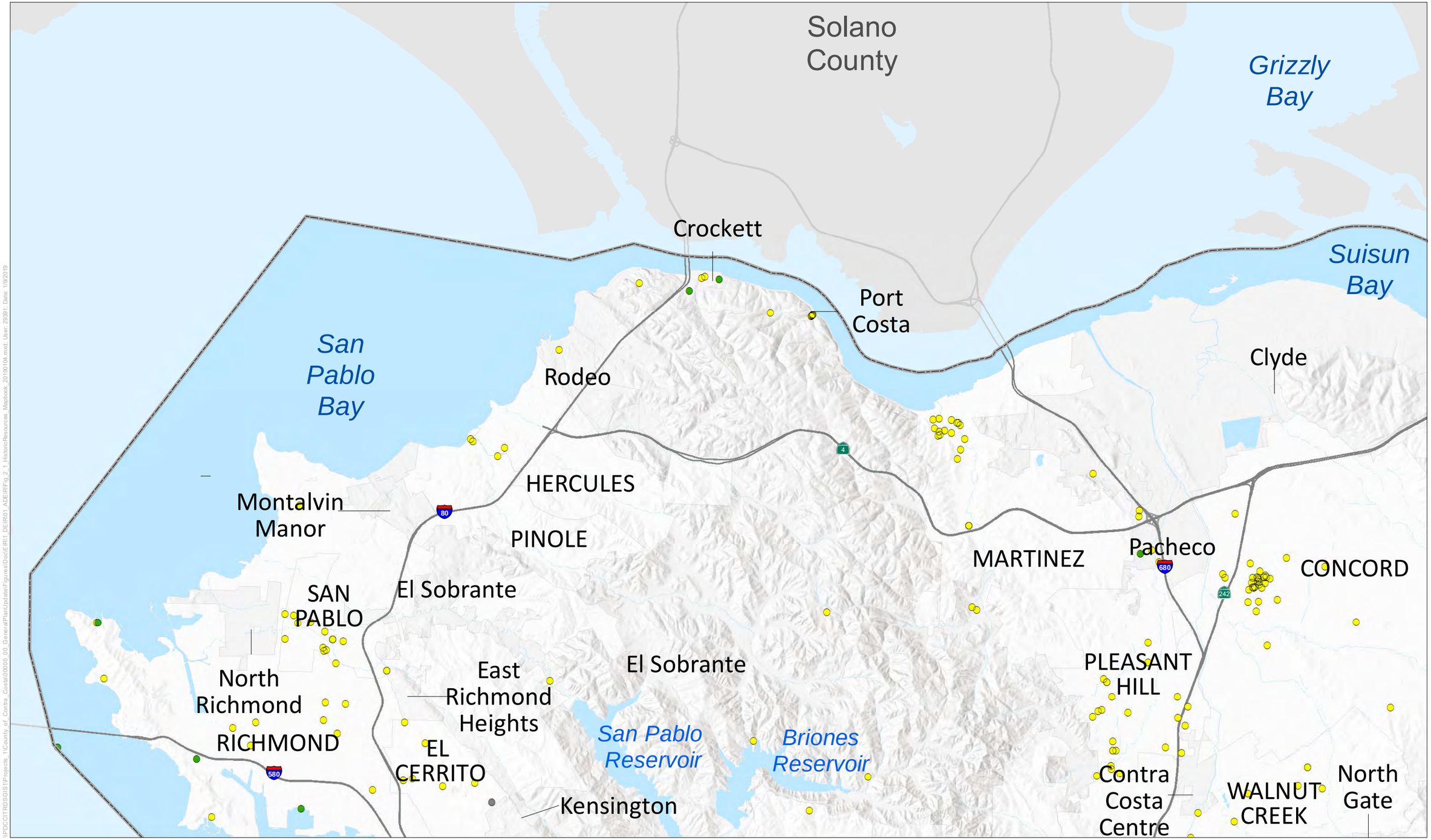

Source: Contra Costa County, 2018; ICF 2018; NWIC 2018

0 0.75 1.5 3 Miles

N

Note: See legend on Overview Map

Figure 2-1
Sheet 1
Previously Identified Built Historic Resources

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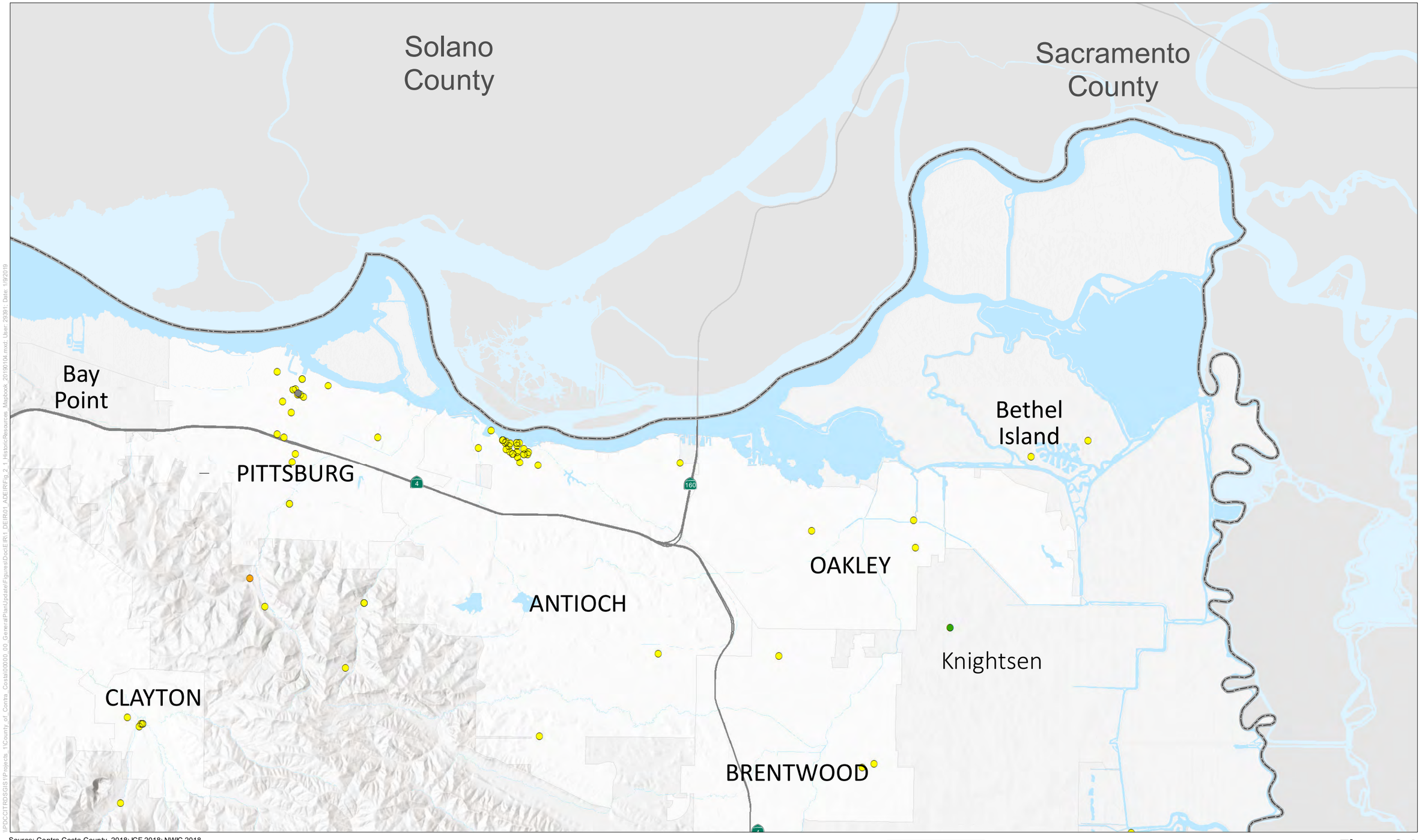

Source: Contra Costa County, 2018; ICF 2018; NWIC 2018

0 0.75 1.5 3 Miles

N

1 2 3 4

Note: See legend on Overview Map

Figure 2-1
Sheet 2
Previously Identified Built Historic Resources

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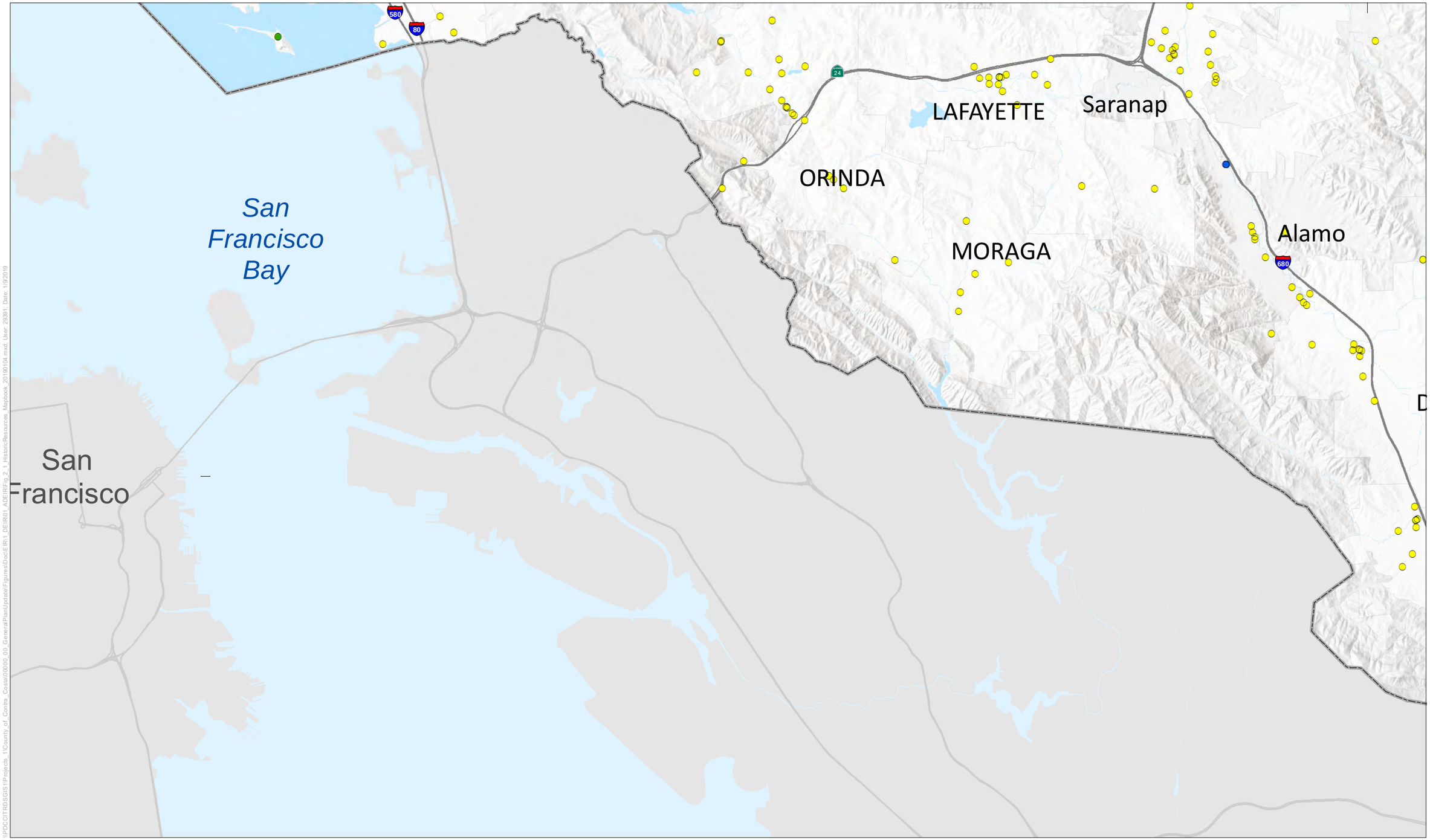


Source: Contra Costa County, 2018; ICF 2018; NWIC 2018

0 0.75 1.5 3 Miles

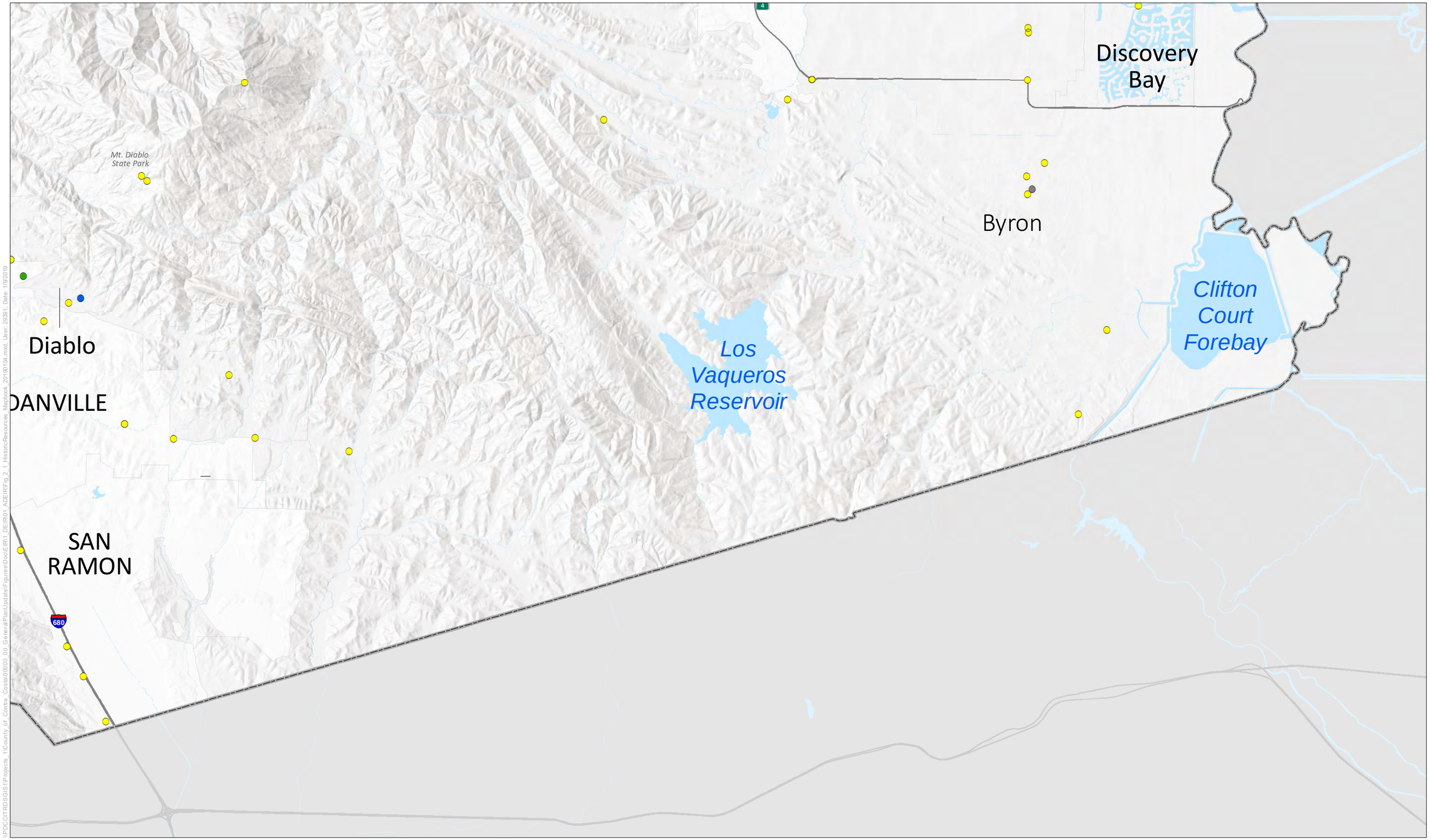
N

Note: See legend on Overview Map

1 2 3 4

Figure 2-1
Sheet 3
Previously Identified Built Historic Resources

\\PDCCITRDSGIS1\Projects_1\County_of_Contra_Costa\00000_00_GeneralPlanUpdate\Figures\DocIEIR\1_DEIR\01_ADEIR\Fig_2_1_HistoricResources_Mapbook_20190104.mxd: User: 29391: Date: 1/9/2019



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Source: Contra Costa County, 2018; ICF 2018; NWIC 2018

0 0.75 1.5 3 Miles

N

1 2 3 4

Note: See legend on Overview Map

Figure 2-1
Sheet 4
Previously Identified Built Historic Resources

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Chapter 3
Archaeological Resources

This chapter describes the archaeological context, updated records search results, and sensitivity of the county.

Prehistoric Context

The cultural chronology of the Bay Area has been summarized by numerous reviewers (Beardsley 1948, 1954; Groza et al. 2011; Heizer and Fenenga 1939; Lillard et al. 1939; Lillard and Purves 1936; Moratto 1992; Schenck and Dawson 1929). These summaries have divided the prehistoric cultural sequence into multiple phases or periods, which are delineated by changes in regional patterns of land use, subsistence, and tool types over time. The sequence includes the following four periods, as described in detail below:

- Terminal Pleistocene (13,500–11,600 calibrated years before the present [cal BP]),
- Early Holocene (11,600–7700 cal BP),
- Middle Holocene (7700–3800 cal BP), and
- Late Holocene (3800 cal BP onward), with further divisions of the Late Holocene based on Groza et al. (2011).

These periods are academic constructs and do not necessarily reflect Native American viewpoints.

Terminal Pleistocene (13,500–11,600 cal BP)

Across the United States, the Terminal Pleistocene is generally considered to be represented by wide-ranging mobile hunters and gatherers who periodically exploited large game (Haynes 2002). Archaeological sites from this period are typically very sparse lithic assemblages with few or no archaeological features or large, fluted projectile points—a diagnostic tool type for this period.

Early Holocene (11,600–7700 cal BP)

The Early Holocene landscape of central California is characterized by semi-mobile hunter-gatherers who exploited a wide range of food resources from marine, lacustrine, and terrestrial contexts (Erlandson et al. 2007; Jones & Stokes 2002; Moratto 2002). Diagnostic artifact types from the Early Holocene often include stemmed points, crescents, and formed steep-edged flake tools (Byrd et al. 2010).

Two sites dated to the Early Holocene have been recorded in the county, including CA-CCO-696 and CA-CCO-637. Both sites are near Los Vaqueros Reservoir. A projectile point, *Olivella* beads, ground and flaked stone, and burials were found in association with both sites. However, radiocarbon dates returned from CA-CCO-696 identified one of the oldest human burials ever dated in the region (Meyer and Rosenthal 1998).

Middle Holocene (7700–3800 cal BP)

The Middle Holocene is characterized by a diverse range of habitation sites and artifact assemblages, which suggest higher population levels, more complex adaptive strategies, and longer seasonal occupation than took place during the Early Holocene. The presence of seasonal waterfowl within assemblages dated to the Middle Holocene suggests more diverse, local-niche based exploitation strategies. Diagnostic artifact types from this period include ground stone; side-notched dart points; cobble (large stone sized) chopping, scraping, and pounding implements; and shell beads and ornaments (Fitzgerald 1993; Meyer and Rosenthal 1998).

Two sites dated to the Middle Holocene have been recorded in the county: the Marsh Creek site in the northern Diablo Range (CA-CCO-18/548) and CA-CCO-474/H near the eastern edge of the San Pablo Bay. Grooved rectangular *Olivella* beads present at CA-CCO-474/H indicate an extensive regional interaction sphere between the Bay Area, the Great Basin to the east, and the Channel Islands to the southwest.

Late Holocene (3800–170 cal BP)

The Late Holocene is generally divided into three sub-periods: Early (4500/3800–2450 cal BP), Middle (2050–900 cal BP), and Late (700–170 cal BP), as discussed below.

Early Sub-period of the Late Holocene (4500/3800–2450 cal BP)

The Early sub-period of the Late Holocene marks the establishment of a number of large shell mounds. Bay margin sites, not surprisingly, revealed a strong emphasis on marine shellfish (particularly bay mussel and oyster), marine fish, and marine mammals, whereas interior sites revealed a strong emphasis on freshwater fish and shellfish, along with terrestrial mammals (Byrd et al. 2010). Diagnostic artifact types from this period include stemmed and short broad-leaf projectile points, square-based knife blades, both unshaped and cylindrical mortars, both short and cylindrical pestles, crescentic stones, perforated charmstones, bone awls, polished ribs, notched and grooved net sinkers, rectangular and spire-lopped *Olivella* beads, rectangular abalone beads, various pendant types, antler wedges, and stone bars or "pencils" (Lightfoot 1997:138).

Two sites dated to the Early sub-period of the Late Holocene have been recorded in the county: the Ellis Landing site (CA-CCO-295) and the Stege Mound (CA-CCO-298) (Banks and Orlins 1981).

Middle Sub-period of the Late Holocene (2050–900 cal BP)

The Middle sub-period of the Late Holocene is characterized by greater settlement permanence (either sedentary or multi-season occupation), mound building, and social complexity and ritual elaboration (Lightfoot 1997; Lightfoot and Luby 2002). New artifact types for this subdivision include barbless and single-barbed bone fishing spears, large mortars, ear spools (or adornments), and varied forms of *Haliotis* and *Olivella* shell ornaments. Some male burials yielded thousands of shell beads. Isotopic analyses of human bone and food remains indicate that terrestrial (faunal) resources were exploited more than shellfish, and the use of the acorn also increased (Bartelink 2006; Bickel 1978; Greengo 1951; Simons 1992; Wohlgemuth 2004; Byrd et al. 2010).

No sites dated to the Middle sub-period of the Late Holocene have been recorded in the county.

Late Sub-period of the Late Holocene (700–170 cal BP)

The Late sub-period of the Late Holocene is the best-documented Late Holocene division throughout the greater Bay Area. New artifact types included clamshell disk beads, distinctive *Haliotis* shell pendants, flanged steatite pipes, chevron-etched bone whistles and tubes, elaborately finished stone "flower pot" mortars, and needle-sharp coiled basketry awls (Milliken et al. 2007:99). Seed exploitation increased, as evidenced by archaeobotanical remains, and sea otters, rabbits, deer, clams, and horn snails were frequently exploited as foodstuffs. The bow and arrow first appeared during the Late period, and extensive trade relations with neighboring groups continued. Funerary rituals were strongly patterned and included flexed interments and "killed" grave offerings, along with occasional cremations (Byrd et al. 2010).

Two sites in dated to the Late sub-period of the Late Holocene have been recorded in the county: the Fernandez site (CA-CCO-259) and the Stone Valley site (CA-CCO-308). An interpretation of data returned from excavations at both sites indicates an evolution to an egalitarian society as well as increased sedentism (Moratto 1992:231–232, 261–264).

Historic Context (1772–present)

Although the Spanish explored the county as early as 1772, significant settlements were not established until the 19th century. In 1822, the newly independent Mexican government began issuing land grants, called ranchos, to its citizens in California. Sixteen of 813 ranchos fell within the current boundaries of the county (U.S. Fish and Wildlife Service 2006:3–70). Most of the land was used for grazing or growing wheat. One such rancho was later purchased by a settler named John Marsh in 1837. It became known as Marsh's Landing and grew into an important commercial center along the San Joaquin River during the California Gold Rush (1848–1852). The success of Marsh's Landing encouraged other American immigrants to purchase land in the area, and permanent communities began to take shape (City of Antioch 2003:4.4–3).

Following California's admittance to the United States in 1850, settlers who stayed in the county focused their economic pursuits on agriculture, which was boosted by the Southern Pacific Railroad's expansion into the region (Contra Costa County 2019). The first packing houses in the county were built in 1910. In addition to wheat, farmers grew olives, almonds, asparagus, apricots, and peaches, although the area suffered during the Great Depression and subsequent droughts (City of Antioch 2015:4.4–5). Coal mining began during the 1960s along the eastern slope of Mount Diablo (U.S. Fish and Wildlife Service 2006:3–70). When the mines closed decades later, the population centers at Pittsburg, Antioch, and Brentwood survived because of an established agriculture-based economy (City of Antioch 2008:171). Today, the county's location along a Bay Area Rapid Transit line allows it to continue to grow; in recent years, it has seen rapid expansion of suburban residential development.

As detailed below in the *Records Search Results* section, 274 historic-era archaeological sites have been recorded in the county; 54 sites have both historic-era and prehistoric components.

Records Search Results

The 2005–2020 General Plan identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the 2005–2020

General Plan. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The results of the 2018 records search for archaeological sites are included in the table in Appendix B.

The archaeological resources summarized above and in the table in Appendix B were identified through small sporadic studies conducted in association with development activities in the county. As of the date of preparation of this report, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Archeological Sensitivity

Figure 3-1, which was originally prepared for the 2005-2020 General Plan, depicts areas of archaeological sensitivity within the county. This figure was prepared using several different data sets, including the locations of previously recorded archaeological sites, proximity to freshwater sources, slope, and areas that have been subject to development. Archaeological sensitivity consists of the following five categories:

- Extremely Sensitive: Areas where archaeological sites exist;
- Highly Sensitive: Areas in proximity to fresh water;
- Medium Sensitivity: Areas that are accessible to waterways;
- Moderate Sensitivity: Areas that were likely to support prehistoric settlement (e.g., the plains and the Delta); and
- Low Sensitivity: Areas that consist mostly of ridge tops due to the steep slope, although special use sites[3] may still exist in these areas.

Urbanized areas are also depicted in Figure 3-1. Although urbanized areas have been subject to development, as-yet undocumented archaeological resources may exist within these areas.

[3] Special use sites were occupied for short periods of time for a particular purpose, such as ceremonial or religious events.

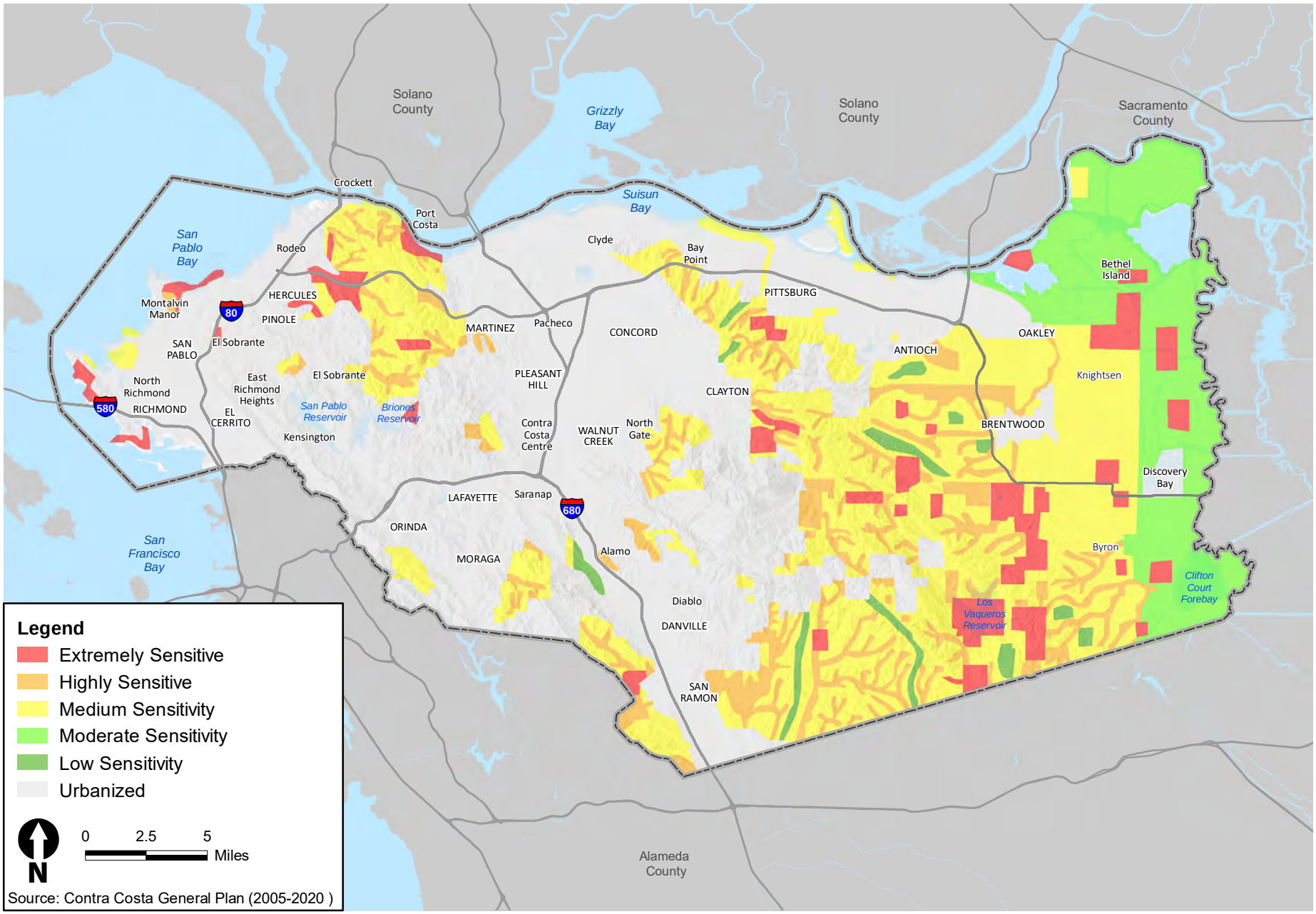

Figure 3-1
Archaeological Sensitivity

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Chapter 4
Tribal Communities

This chapter describes tribal communities that existed within the county, both historically and in the present day.

The county is located in an area where the traditional territories of three tribal communities converged: Bay Miwok, Northern Valley Yokuts, and Ohlone. The territory and characteristics of the tribal communities are described below.

Figure 4-1 depicts ethnographically identified[4] villages and their Native American group affiliation.

Bay Miwok

The Bay Miwok are considered part of the Eastern Miwok, one of two major divisions in the Miwokan language. The Miwokan language groups are further broken down into five distinct groups: Plains, Bay, Northern Sierra, Central Sierra, and Southern Sierra (Levy 1978a:398).

The Bay Miwok inhabited the inner Coast Range, with territory stretching through eastern Contra Costa County, from Mount Diablo to the Delta, as shown in Figure 4-1. The Bay Miwok were politically organized by tribelet, with each having a designated territory. A tribelet, which consisted of one or more villages or camps within a territory, was designated by physiographic features. Each tribelet was treated as an independent entity that controlled the geographic region as well as the resources within the region. Lineage was very important to the Bay Miwok; each tribelet comprised several lineages and often included permanently settled habitation areas (Levy 1978a:398–402).

The Bay Miwok were primarily hunter-gatherers. Terrestrial game such as mule deer, tule elk, pronged antelope, and mountain lion were hunted, and traps were set for smaller game such as rabbit and quail. Waterfowl were a very important part of the tribal diet and trapped along the rivers and sloughs of the Delta. Plant resources were of particular importance to the Bay Miwok. Groups would travel seasonally into the foothills or plains to gather particular resources. Acorns of several varieties were collected as well as nuts such as buckeye, hazelnut, and pine nut. Seeds, roots, and berries were also valued (Levy 1978a:402–402).

The Bay Miwok first encountered the Spanish in the late 18th century as the foreigners explored the Sacramento-San Joaquin Valley. Although missionization occurred later than it did bayward of the Coast Range, the Bay Miwok were the first of the Eastern Miwok to experience forced conversion. The Bay Miwok neophytes, along with those of the Plains Miwok, were transported to Mission San Jose. These expeditions often resulted in the neophytes fleeing back to their villages, and the Spanish sending military expeditions to bring them back. The Bay Miwok suffered greatly as a consequence of Spanish missionization, with a large portion of the population dying after exposure to diseases or military conflict (Levy 1978a:400–401). Although the Bay Miwok are not currently federally recognized, many descendants still reside in the Bay Area.

[4] Ethnographically villages are identified through cultural observation and by collecting oral histories.

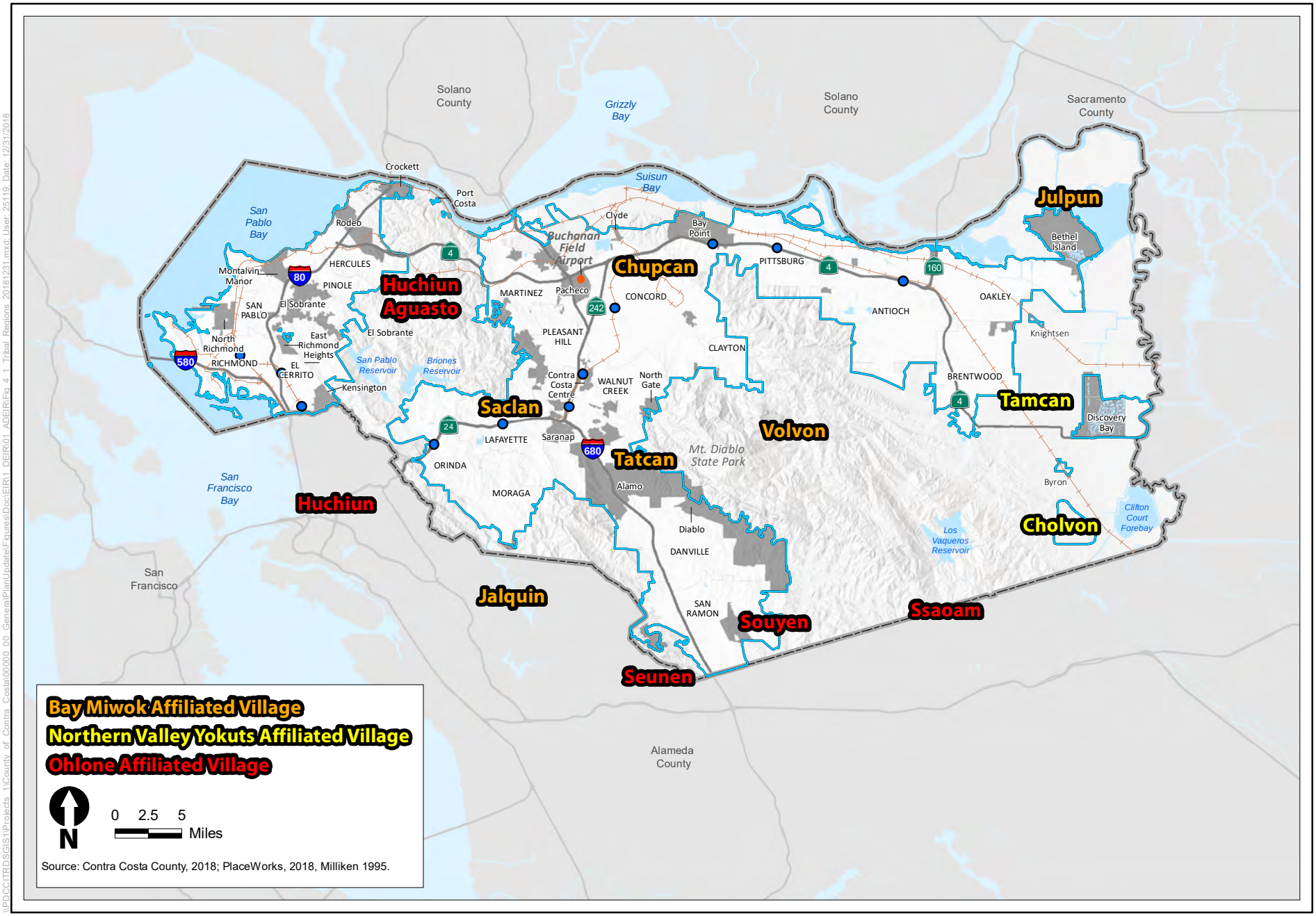

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Figure 4-1
Native American Groups and Affiliated Villages

Northern Valley Yokuts

The Northern Valley Yokuts are the historical occupants of the central and northern San Joaquin Valley. Their territory extended from near the area where the San Joaquin River bends northward to a line midway between the Calaveras and Mokelumne Rivers, including the southeastern portion of the county, as shown in Figure 4-1 (Wallace 1978:462). Villages were typically located along primary water sources, such as the San Joaquin River. The Northern Valley Yokuts gained much of their livelihood through fishing, hunting waterfowl, and harvesting acorns, tule root, and seeds (Wallace 1978:464). Most settlements, or at least the principal ones, were built atop low mounds on or near the banks of large watercourses for protection against spring flooding (Schenck 1926:132; Schenck and Dawson 1929:308; Cook 1960:242, 259, 285). Each tribe had a headman, and populations averaged around 300. Family houses were round or oval, with a conically shaped pole frame that was sunk into the ground and covered with tule mats. Each village typically had a community lodge and a sweathouse (Wallace 1978:465).

The Northern Valley Yokuts suffered a great population decline and cultural breakdown when they were drawn into the mission system. Compelled to work at unfamiliar tasks and subjected to severe discipline, neophytes deserted the missions and returned to their traditional homes; however, they were usually brought back, sometimes by force (Wallace 1978:468). Following the mission period, Northern Valley Yokuts continued to clash with the white settlers, and as a result, many villages were burned, and the population declined. This decline continued through the Early American period, as the rich soils of the Delta and Central Valley attracted many former miners and other settlers to farming. As settler populations grew, the remaining Yokuts were driven off their hunting and food-gathering lands (Wallace 1978:468–469).

The demoralizing conditions suffered by the Yokuts gave way in 1870 to widespread but short-lived participation in the Ghost Dance. The Ghost Dance promised the return of dead relatives, freedom from sickness and death, peace and prosperity, and the disappearance of whites. By 1875, interest in the Ghost Dance had died after the new world envisioned by the cult failed to materialize. Today, the descendants of the Yokuts live on the Tule River Reservation, established in 1873 near Porterville, California, and the Santa Rosa Rancheria, established in 1921 near Lemoore, California (World Culture Encyclopedia 2008).

Ohlone

The Ohlone are a linguistically defined group, composed of several autonomous tribelets that spoke eight different but related languages. The Ohlone languages, together with Miwok, compose the Utian language family of the Penutian stock. The territory of the Ohlone people extended along the coast from the Golden Gate to just below Carmel and as far inland as 60 miles, encompassing several inland valleys (Levy 1978b:485–486). The Ohlone occupied the western portion of the county, as shown in (Figure 4-1).

The Ohlone were hunter-gatherers and relied heavily on acorns and seafood. They also exploited a wide range of other foods, including various seeds, the growth of which was promoted by controlled burning; buckeye; berries; roots; land and sea mammals; waterfowl; reptiles; and insects. The Ohlone used tule balsas for watercraft and bow and arrow, cordage, bone tools, and twined basketry to procure and process their foodstuffs (Levy 1978b:491–493).

Prior to contact, the Ohlone were politically organized by tribelet, with each having a designated territory. A tribelet, which consisted of one or more villages or camps within a territory, was designated by physiographic features. This type of organization was prevalent in precontact California (Kroeber 1962). The office of tribelet chief was inherited patrilineally but could be occupied by a man or a woman. Duties of the chief included providing for visitors, overseeing ceremonial activities, and directing fishing, hunting, gathering, and warfare expeditions. The chief served as the leader of a council of elders that functioned primarily in an advisory capacity to the community (Harrington 1933:3 in Levy 1978b:487).

Ohlone villages typically had four types of structures. Dwellings were generally domed structures with central hearths. They were thatched with tule, grass, or other vegetal material and bound with willow withes. Sweathouses were used by men and women and usually located along streambanks. A sweathouse consisted of a pit that was excavated into the streambank, with a thatched portion constructed against the bank. Dance structures were circular or oval in plan and enclosed by a woven fence of brush or laurel branches, standing approximately 1.5 meters. The assembly house was a thatched structure that was domed and large enough to accommodate all of the inhabitants of the village (Crespi 1927:219; Levy 1978b:492).

Seven Spanish missions were founded in Ohlone territory between 1776 and 1797. While living within the mission system, the Ohlone commingled with other groups, including the Esselen, Yokuts, Miwok, and Patwin. Mission life was devastating to the Ohlone population (Milliken 1995). It has been estimated that the Ohlone population numbered around 10,000 in 1776, when the first mission was established in Ohlone territory. By 1832, the Ohlone population was less than 2,000 as a result of introduced disease, harsh living conditions, and reduced birth rates (Cook 1943a, 1943b in Levy 1978b:486).

Although they have yet to receive formal recognition from the federal government, the Ohlone are becoming increasingly organized as a political unit and developing an active interest in preserving their ancestral heritage. In the later part of the 20th century, the Galvan family of Mission San Jose worked closely with the American Indian Historical Society and "successfully prevented destruction of a mission cemetery that lay in the path of a proposed freeway. These descendants incorporated as the Ohlone Indian tribe, and now hold title to the Ohlone Indian Cemetery in Fremont" (Yamane 1994 in Bean 1994:xxiv). Many Ohlone are active in maintaining their traditions and advocating for Native American issues.

Chapter 5
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Personal Communication

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Appendix A
Historic Resources in Contra Costa County

Table A-1: Historic Resources Inventory for the Unincorporated Areas of Contra Costa County

Area	Resource/Location	Street No./Street Name	City	State	Zip Code	Evaluation Category	Significance/Importance
ANTIOCH AREA	ANTIOCH LUMBER CO. 340 West Second Street Incorporated	340 W 2nd St	Antioch	CA	94509	Structure of Historical Significance/Architectural Specimen	One of the oldest mercantile firms in Antioch, founded in 1864 and thought to be the oldest lumber concern in California still in the business of selling lumber. Structure exhibits good planning and design and relates to early American architecture.
ANTIOCH AREA	R.B. HARD BUILDING 815 First Street Moved to 809 First Street Incorporated	809 1st St	Antioch	CA	94509	Structure of Historical Significance	This building was built in the mid-1860s by R.B. Hard, the first chairman and later president of the Antioch Board of Trustees in 1872.
ANTIOCH AREA	DONLON HOME 606 West Third Street Moved to Coal Mine (Regional Park District) Incorporated	5175 Somersville Rd	Antioch	CA	94509	Structure of Historical Significance	This structure, built in the late 1870s was the birthplace of James D. Donlon, former Mayer of Antioch and City councilman for many years.
ANTIOCH AREA	ANTIOCH PIONEERS LANDING SITE Foot of "F" Street at Waterfront	416 W 2nd St	Antioch	CA	94509	Site of Historic Event	Monument erected to denote the landing site of the pioneers that landed with Captain George W. Kimball and the birthplace of the City of Antioch on September 16, 1850.
ANTIOCH AREA	FIRST CONGREGATIONAL CHURCH West Sixth and "F" Streets	518 W 6th St	Antioch	CA	94509	Structure of Historical Significance	On June 12, 1865, Captain G.W. Kimball, pioneer settler, chaired a meeting for all those interested in forming a church. A. constitution was adopted and the First Congregational church was founded. The original Church was dedicated May 16, 1869. The present structure, erected in 1891, is the oldest church building in Antioch.
ANTIOCH AREA	WILLS RANCH HOUSE 319 W. Ninth St	319 W 9th	Antioch	CA	94509	Structure of Historical Significance	In 1868, T.N. Wills moved to Antioch and purchased 280 acres of land for farming. His home was built in 1871 and was the ancestral home of the Wills family and Helen Wills Moody, the tennis star.
ANTIOCH AREA	EMPIRE RAILROAD SITE MOUNMENT & SECTION OF TRACKS Foot of "F" Street at Riverfront. Tracks removed & stored at Antioch streets yard.	416 W 2nd St	Antioch	CA	94509	Site of Historic Event	Monument erected to denote the narrow gauge railroad tracks of the Empire Railroad and the coal mining industry of 1877 to 1902. Coal was transported from mines to the coal wharf at Antioch by this railroad.
ANTIOCH AREA	CHARLES MARSH HOUSE 601 West Fourth Street Incorporated	601 W 4th St	Brentwood	CA	94513	Site of Historic Significance	Although no longer standing, the home of Charles Marsh, son of pioneer John Marsh, built in 1887, was located here. Charles was a Justice of the Peace and a butcher. The structure was later the home of Judge Harley, famous jurist and lawyer in Contra Costa County.
ANTIOCH AREA	JOSLIN HOME 502 West Second Street Incorporated	502 W 2nd St	Oakley	CA	94561	Structure of Historical Significance	Noted as an early business in Antioch. The structure was the residence and harness shop of J.B. Joslin.
ANTIOCH AREA	ODD FELLOWS HALL W. Third and "H" Streets	625 W 3rd St	Antioch	CA	94509	Structure of Historical Significance	Structure was first known as Union Hall and was also the City Bakery. Later the San Joaquin Lodge #151 of Independent Order of Odd Fellows and Antioch Lodge #175 of Free and Accepted Masons held meetings here.

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ANTIOCH AREA	ATCHISON-TOPEKA AND SANTA FE DEPOT 816 West First Street	816 W 1st St	Antioch	CA	94509	Structure of Historical Significance/Architectural Specimen	H.F. Beede of Rouse, Forman and Beede Lumber Company obtained the right-of-way for the railroads in 1899. The San Francisco and San Joaquin Valley Railroad now known as the Atchison-Topeka and Santa Fe had its Eastern Terminal in Antioch for many years. The depot was built about 1902 and until destroyed by fire was an example of style and architecture familiar to the Atchison-Topeka and Santa Fe Railroad.
ANTIOCH AREA	McKELLIPS HOUSE 504 West Sixth Street	504 W 6th St	Antioch	CA	94509	Structure of Historical Significance	Built in 1886 as the home of S. McKellips, locomotive engineer in charge of the rolling stock for the Empire Railroad. He fired up the "Empire" September 22, 1877, a 15-ton Baldwin Engine, the first engine to turn a wheel in Antioch.
ANTIOCH AREA	ANTIOCH CITY HALL West Third and "H" Streets Incorporated	200 H St	Antioch	CA	94509	Site of Historic Significance	Although no longer standing, this structure was built in 1919 as City Hall and Jail. Structure was a two-story cut stone building with a medium hip roof, decorated boxed cornice frieze and brackets. Structural window detail varied from molded arch top and balcony shelf at bottom at the second story to Victorian style on the first floor. Door opening was arched with decorated flat columns attached flush to wall.
ANTIOCH AREA	BROWN HOUSE 219 West Sixth Street Incorporated	219 W 6th St	Antioch	CA	94509	Structure of Historical Significance	Built about 1890, this structure housed the G.W. Brown family and later Henry E. Beede. Both men were quite active in civic affairs and the development of Antioch.
ANTIOCH AREA	REMFREE HOUSE 512 "E" Street Incorporated	512 E St	Antioch	CA	94509	*Architectural** Specimen	Built about 1870, as home of Remfree, a local barber. It is a 1-½ story wood frame structure with a two-story tower at one corner having a conical shape roof. Gabled dormer extends from a medium hip roof. A bay window extends the height of the first story on the south side of the structure.
ANTIOCH AREA	BEEDE HOUSE 119 Beede Way Incorporated	119 Beede Way	Antioch	CA	94509	Structure of Historical Significance/Architectural Specimen	About 1895, a Mr. Sloan built a home for Mr. H.F. Beede, known as "Country Home." The structure has two stories with medium hip roof and open verandas at the first and second story. Mr. Beede, a businessman and civic leader, is credited with forming the Riverview Union High School.
ANTIOCH AREA	COX HOUSE 119 West Sixth Street Incorporated	119 W 6th St	Antioch	CA	94509	*Architectural** Specimen	A two story wood frame structure with high gable composition shingle roof, and combination of patterned wood shingle, board and batten and composition shingle siding. A plain horizontal band is located between floor levels to provide a wall design. Two large palm trees in front add to the overall appearance.
ANTIOCH AREA	STAMM HOUSE 501 "B" Street Incorporated	501 B St	Antioch	CA	94509	*Architectural** Specimen	A one story wood frame structure with a medium gable roof and low center gable over the front entrance. Main floor is elevated over a basement and platform type stairs to an open porch provides entrance. The structure reflects the architectural style circa 1910.
ANTIOCH AREA	CASINO THEATER West First and "H" Streets	809 W 1st St	Antioch	CA	94509	Structure of Historical Significance	Circa 1870s this site was the warehouse of one of the oldest mercantile firms in Antioch, now known as the Antioch Lumber Company, founded in 1864. Warehouse was later torn down for the Casino Theater circa 1910.

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ANTIOCH AREA	ANTIOCH GRAMMAR SCHOOL West Fifth and "G" Streets Incorporated	1259, 510 G St	Antioch	CA	94509	Site of Historic Event	The site of a very fine brick school building in 1880. It was replaced by a wooden building in 1890. Site is now occupied by the present Administration Offices of the Antioch School District.
ANTIOCH AREA	MULHARE HOUSE West Second and "I" Streets	720 W 2nd St	Antioch	CA	94509	Site of Historic Event	Catholic services were first held in 1864 at this homesite. Part of the original home is enclosed within the present structure.
ANTIOCH AREA	KIMBALL HOME West Third near "E" Street	400 W 3rd St	Antioch	CA	94509	Site Relating to Important Person in History	Site of Captain G.W. Kimball's home that he built in the Fall of 1850. One of the first settlers of Antioch, he was a Postmaster and served as a Justice of the Peace.
ANTIOCH AREA	SMITH'S LANDING Fulton shipyard Road	1 Marina Plaza	Antioch	CA	94509	Site Relating to Important Person in History	Site of W.W. Smith's home, an early settler and founder of Antioch. The first wharf built in Antioch known as Smith's Landing was located at this site.
ANTIOCH AREA	EMPIRE BASIN AREA Empire Mine Road	Empire Mine Rd and Starmine Tr	Antioch	CA	94531	Site of Historic Event	Served by the Empire Narrow Gauge Railroad to Antioch, 1878 to 1903. Sites of Judsonville, Empire Mine, Stewartsville and Star Mine.
ANTIOCH AREA	HARKINSON HOUSE West Fourth and "D" Streets	220 W 4th St	Antioch	CA	94509	*Architectural** Specimen	A one-story wood frame structure with high gable roof and gable dormer. A turret with windows and conical roof is located over a porch that is semicircular in design and extends from the front of the structure, circa 1890.
ANTIOCH AREA	GEORGE HOUSE 223 West Sixth Street Incorporated	223 W 6th St	Antioch	CA	94509	Site Relating to Important Person in History	Although no longer standing, this structure was built for Dr. W.S. George, physician and surgeon. He was City Health officer, member of the City Trustees, a School Trustee, member of the Antioch Board of Trade and surgeon for the Southern Pacific and Santa Fe Railroad.
ANTIOCH AREA	BAKER HARDWARE AND PAINT STORE West Second and "G" Streets	205 G St	Antioch	CA	94509	Structure of Historical Significance	Structure housed an early general hardware business in Antioch, circa 1880. The Antioch Post Office was located in the rear of the building periodically depending on which political party was in office.
ANTIOCH AREA	PIONEER HOSPITAL West Fifth and "H" Streets	414 H St	Antioch	CA	94509	Structure of Historical Significance	Opened in 1930 by Dr. Nevino and operated by Mrs. Brooks, a nurse from San Francisco, for a few years. Now a residence.
ANTIOCH AREA	RIVERVIEW UNION HIGH West FOURTH Street and Somersville Road Incorporated	1500 W 4th St	Antioch	CA	94509	Structure of Historical Significance/Architectural Specimen	The Riverview Union High School District was established June 1, 1903, and the school opened in 1910 with thirty-two pupils. This District included Antioch, Black Diamond, Somersville, Carbondale, and later the Live Oak area. Structure is a two story brick building with quoin wall design, flat roof with parapet and decorated window detail.
ANTIOCH AREA	BELSHAW HOUSE West Seventh and "E" Streets	705 E St	Antioch	CA	94509	Structure of Historical Significance	Mr. Charles M. Belshaw was an active participant in local and state activities. He was a member of the State Assembly in 1894 and a State Senator in 1900.
ANTIOCH AREA	MARSH LANDING Pacific Gas Electric	3307 Wilbur Ave	Antioch	CA	94509	Site Relating to Important Person in History	Site of John Marsh's Ranch shipping center with a blacksmith shop, warehouse, smokehouse and landing area.
ANTIOCH AREA	WILLIAMSON RANCH Lone Tree Road	4900 Lone Tree Way	Antioch	CA	94531	Structure of Historical Significance/Architectural Specimen	This house was built by Williamson, one of the first settlers along Lone Tree Way. It was recently included on the National Register of Historic Places.
CLAYTON AREA	CLAYTON COMMUNITY HALL Oak and Center Streets Incorporated	6008 Center St	Clayton	CA	94517	Structure of Historical Significance	This structure was built in the late 1860s and left to the community by Joel Clayton, for use as a church and a community hall. Throughout the years it has been the scene of religious worship, private and public celebrations, community dances, election balloting, City Council and Planning Commission meetings.

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CLAYTON AREA	JOEL CLAYTON HOME Keller Property Incorporated	6101 Main St	Clayton	CA	94517	Structure of Historical Significance	Home of Joel Clayton, founder of Clayton. A patent on 1,200 acres of land was granted to Joel Clayton by governor of State, Newton Booth, the eighth day of February 1872. Joel Clayton, an English immigrant, had mapped the Clayton Townsite in 1857, expecting it to prosper as a center for mining developments.
CLAYTON AREA	DE MARTINI WINERY Clayton Road Incorporated	5919 Clayton Rd	Clayton	CA	94517	Structure of Historical Significance	In the middle 1860s Joel Clayton, founder of Clayton, planted 28 acres with a variety of grapes and built a small winery which became known as "The Sherry House." After Joel Clayton's death in 1872, his property was bought by Paul De Martini, who expanded the vineyards and built the large stone winery that produced prize-winning Port and Sherry—first place at St. Louis Exposition in 1903.
CLAYTON AREA	MT. DIABLO WINERY Marsh Creek Road					Structure of Historical Significance	Mt. Diablo Winery, built in the 1880s, was the largest in Clayton Valley with a capacity of 300,000 gallons. It operated as a winery in the 1940s, making it the last producing winery in Clayton.
CLAYTON AREA	LA COCOTTE RESTAURANT 6115 Main Street Incorporated	6115 Main St	Clayton	CA	94517	Structure of Historical Significance/Architectural Specimen	Structure was originally a home. Use changed to a post office between 1908-1910, (Clayton's first), then a barber shop, and later a saloon. Historic name, "The Growler." Architecture is early western with a false front roof.
CLAYTON AREA	EASLEY HOME Marsh Creek Road					Architectural* Specimen	A two-story rectangular wood-frame structure with wood shingled medium hip roof. An open porch at the first and second story extends completely around the building. French-style doors open from porch. Prior it was used as bunk house and later a tavern.
CLAYTON AREA	PIONEER INN Main Street Incorporated	6055 Main St	Clayton	CA	94517	Structure of Historical Significance	Once a coach stop on the route from Oakland to Stockton, the "Clayton Hotel" as it was known at that time, has a notorious history of "wild and wooly: characters of the growing west.
CLAYTON AREA	COPPER AND SILVER MINES Mt. Zion Mitchell Canyon Road	96 Mitchell Canyon Rd	Clayton	CA	94517	Site of Historic Event	In 1863 the discovery of copper in the Clayton area brought in many prospectors. According to one assay, there was $48.33 in gold and $243 in silver to the ton. Copper contact varied between 8-12%.
CLAYTON AREA	MT. DIABLO QUICKSILVER CLAIM Marsh Creek Road	On Google Maps: "North Peak"	Clayton	CA	94517	Site of Historic Event	The Mt. Diablo Quicksilver Mine was discovered in 1862.
CLAYTON AREA	MORGAN HOUSE Morgan Territory Road					Site Related to Important Person in History	Jeremiah Morgan settled in this area, known as Morgan Territory, in 1856. He claimed and fenced 10,000 acres for the raising of Black Angus cattle. He also built a granary. Morgan built his home, circa 1857, of lumber that he hauled by oxen teams from the Santa Cruz Mountains. The old home burned down in 1932.
CONCORD AREA	SALVIO PACHECO ADOBE 2050 Adobe Street Incorporated	2050 Adobe St	Concord	CA	94520	Structure of Historical Significance/Architectural Specimen	Don Salvio Pacheco—soldier-surveyor of Pueblo Public Lands—settled here in 1828. Was awarded this grant called "Monte Del Diablo" in 1835 by Governor Jose Figueroa. The adobe was completed June 24, 1853. In 1853, settlers located west of here and named the place Pacheco. Pacheco was destroyed by great floods. Don Salvio Pacheco gave land surrounding the adobe in 1868 to the Pacheco flood refugees and the settlement became known as "Todos Santos"—now known as Concord. California Historical Landmark #515.

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CONCORD AREA	FERNANDO PACHECO ADOBE 3119 Grant Street Incorporated	3119 Grant St	Concord	CA	94520	Structure of Historical Significance/Architectural Specimen	Home of Don Fernando Pacheco, son of Don Salvio Pacheco and second home to be built in the valley, circa 1844. The structure is still in use as a museum and also a social club. It was restored in 1941 as a landmark of a typical Spanish-California home. California Historical Landmark #455.
CONCORD AREA	FRANCISCO GALINDO HOME Incorporated	1721 Amador Ave	Concord	CA	94520	Structure of Historical Significance/Architectural Specimen	The two-story early Victorian-style structure built in the 1850s and remodeled in the 1880s is the home of descendants of early day Spanish soldiers and colonists whose exploits eventually led to the founding of Concord by Don Salvio Pacheco and his son-in-law Francisco Galindo who moved a small building to the present site in 1860 and through additions to the structure remodeled it to its present appearance.
CONCORD AREA	TODOS SANTOS PLAZA Willow Pass Road and Grant Street Incorporated	2175 Willow Pass Rd	Concord	CA	94520	Site Relating to Important Person in History	In 1868 Don Salvio Pacheco, Francisco Galindo and Fernando Pacheco donated land to for the town of Todos Santos, "All Saints," now Concord. The land was formerly part of Rancho Monte del Diablo, a grant by Mexico in 1834.
CONCORD AREA	THE LAGUNA 1860 Laguna Street Incorporated	1860 Laguna St	Concord	CA	94520	Site Relating to Important Person in History	A natural lake which Don Salvio Pacheco marked on his original diseno when he petitioned for the land grant Rancho Monte del Diablo. The lake shores are now abutted by residential apartments and roadways. Boating and fishing takes place on the lake.
CONCORD AREA	FIRE HALL 1982 Concord Avenue Incorporated	1982 Concord Ave	Concord	CA	94520	*Architectural** Specimen	Built in 1833 on Mt. Diablo Street as a fire house. Moved in 1911 to 2080 Willow Road to make room for the construction of Concord Inn. Structure is wood frame with a false front and a decorated roof and front wall trim. A molded arch with center keystone surrounds semi-circular windows. Plain wood shingles, board and batten and shiplap finish the outside walls. The structure has been moved to Concord Avenue.
CONCORD AREA	MALTBY HOUSE 3033 Bonifacio Street Incorporated	3033 Bonifacio St/church	Concord	CA	94519	Structure of Historical Significance/Architectural Specimen	Home of Adolphus Maltby who donated land to the town for the high school. He was one of the original promoters of the Oakland, Antioch and Eastern Railroad. Home is presently being restored to its original appearance as a two-story stucco structure with a tiled truncated hip roof and three dormers. Balconies with wrought iron railings are featured throughout the first and second stories with French doors opening onto them. Large pillars support an open porch and breezeway.
CONCORD AREA	L.B. McKINNON HOME 2360 East Street Incorporated	2350 Pacheco St	Concord	CA	94520	Structure of Historical Significance	First Adolphus Maltby house built on the Maltby Ranch.
CONCORD AREA	WEBB-SOTO HOUSE 2243 Mt. Diablo Street Incorporated	2243 Mt Diablo St	Concord	CA	94520	Structure of Historical Significance/Architectural Specimen	A Victorian-style structure built around 1880-1890 by Captain Barney Webb. It was occupied for many years by Presentacion M. de Soto whose ancestors were among those who arrived in California with Captain de Anza in 1776.
CONCORD AREA	KABLE HOUSE 2108 Grant Street Incorporated	2108 Grant St	Concord	CA	94520	Structure of Historic Significance	One of the earliest houses in Concord. In the 1870's it was the residence of Thomas Kable at the corner of Pacheco and Grant Streets it was moved to the rear of the Bibber house at 2108 Grant Street.
CONCORD AREA	CONCORD GRAMMAR SCHOOL Southeast corner of Bonifacio and Grant Streets	2190 Grant St	Concord	CA	94520	Site Relating to Important Person in History	Site of the Concord Grammar School, built in 1870 on land donated by Fernando Pacheco, one of the founders of Concord.

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CONCORD AREA	BIBBER HOUSE 2108 Grant Street Incorporated	2108 Grant St	Concord	CA	94520	Structure of Historical Significance/Architectural Specimen	The Home of Charles Bibber, a Deputy County Assessor for over 50 years. The structure is representative of a New England-style house of the early 1900s with a stucco siding.
CONCORD AREA	BEEBE HOUSE 1465 Concord Avenue Incorporated	1465 Concord Ave	Concord	CA	94520	Structure of Historical Significance	Home of Mr. Beebe, an early settler in Concord in 1868, a farmer and merchandiser with Concord firm of Navas and Beebe.
CONCORD AREA	FIRST PRESBYTERIAN CHURCH BUILDING Galindo Street between Pacheco and Bonifacio Street	2130 Galindo St	Concord	CA	94520	Site of Historic Event	In 1882, Mr. Samuel Bacon, one of the first merchants to move from the flooded town of Pacheco to Concord, donated the land for the First Presbyterian Church. The church was later used as a boarding house.
CONCORD AREA	IVEY HOUSE 2061 Grant Street Incorporated	2061 Grant St	Concord	CA	94520	*Architectural** Specimen	A one-story wood frame structure built in 1870 or 1880. A cottage-style structure.
CONCORD AREA	SAM BACON'S STORE Galindo and Salvio Streets Incorporated	2033 Salvio St	Concord	CA	94520	Site of Historic Event	Site of one of the first stores to move from Pacheco to the new town of Todos Santos, now Concord. Sam Bacon was the owner of the store and accepted Don Salvio Pacheco's invitation to move into the new town.
CONCORD AREA	CONCORD HOTEL OR KLEIN AND LORING'S Mt. Diablo and Salvio Streets	2151 Salvio St	Concord	CA	94520	Site of Historic Event	Site of one of Concord's first hotels, built in 1869 by Henry Loring. Purchased by Philip Klein in 1870. Structure removed in 1970.
CONCORD AREA	LAMBERT BAKERY North side of Salvio Street near Concord Avenue Incorporated	2031 Salvio St	Concord	CA	94520	Site of Historic Event	Site of first bakery in Concord built before 1884 by John Lambert. A brick structure dated 1884 was added to frame structure. Bother structures were demolished in 1967.
CONCORD AREA	SACRAMENTO NORTHERN RAILROAD DEPOT Clayton Road and East Street Incorporated	1451 Oakland Ave	Concord	Ca	94520	Site of Historic Event	Site of Sacramento Northern Railroad Depot, known as the Oakland, Antioch and Eastern Railway. In 1911 the first car completed its run from Baypoint (Port Chicago) to Concord.
CONCORD AREA	COUNTY FAIR GROUNDS North side of Concord Avenue and Bisso Lane Incorporated	2333 Bisso Ln	Concord	Ca	94520	Site of Historic Event	Concord became the location for the fairs in 1861.
CONCORD AREA	CONCORD RACE TRACK Junction Parkside, Sinclair and Clayton Roads					Site of Historic Event	Concord race track in the early 1900s was one of the fastest tracks in the state. It closed about 1915.
CONCORD AREA	FIRST AIR FIELD North of Clayton Road between West Street and Denkinger Road	1506 West St	Concord	CA	94520	Site of Historic Event	Air field opened in 1925 and became the western terminus of the trans-continental mail service. In 1927 Boeing took over the airport and Concord became an auxiliary landing field in 1933.
CONCORD AREA	McKENZIE HOUSE 2460 Salvio Street	2460 Salvio St	Concord	CA	94520	Structure of Historical Significance	The McKenzie house was built in the 1870s by Mr. Goodale, an early merchant. Dr. George McKenzie lived here and used the facility as his office.
CONCORD AREA	COWELL CEMENT PLANT SITE – SMOKE STACK Ygnacio Valley and Cowell Roads Incorporated	5150 Montecito Dr	Concord	CA	94521	Site of Historic Event	A smokestack stands as a remaining monument to the Cowell Cement Plant, and also as of the last landmarks one of the town of Cowell.
CONCORD AREA	ST. STEPHENS CEMETERY Monument Boulevard and Monument Court Incorporated	2701 Monument Ct	Concord	CA	94520	Site of Historic Event	St. Stephens's cemetery was established in 1903 on land that was part of Francisco Galindo's holdings.

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CONCORD AREA	CONCORD ODD FELLOWS Salvio and Colfax Streets	1965 Colfax St	Concord	CA	94520	Site of Historic Event	Hall first stood in Pacheco in 1871. It was moved to Concord on rollers in 1895.
CONCORD AREA	ALVES HOUSE 2190 Grant Street Incorporated	2190 Grant St	Concord	CA	94520	*Architectural** Specimen	This is a Victorian residence of the "Italianate"-style, probably dating from around 1880. Special features of the site are the surrounding picket fence and the barn whose false front design echoes the façade of the residence.
CONCORD AREA	ELWORTHY HOUSE 2118 East Street Incorporated	2118 East St	Concord	CA	94520	Structure of Historical Significance	A California version of the "Prairie School" style popular around 1920. It is now being restored. Mr. Elworthy was a banker, rancher and civic leader.
CONCORD AREA	BARNETT HOUSE East Street	2080 East St	Concord	CA	94520	Structure of Historical Significance	"Prairie House" of the 2080 early 20th Century. One of a row of large houses along East Street. Residence originally of civic leader in Concord.
CONCORD AREA	NEUSTAEDTER HOUSE 2156 Grant Street Incorporated	2156 Grant St	Concord	CA	94520	Structure of Historical Significance	Built for Bernhardt "Barney" Neustaedter in 1906 by L.V. Perry, a local contractor. Was built when merchants were getting more established in town. Their "Pioneer Store" on Salvio Street was a busy center.
CONCORD AREA	FOSKETT FOSKEH-ELWORTHY (OLD BANK BUILDING) 2001 Salvio Street Incorporated	2001 Salvio St	Concord	CA	94520	*Architectural** Specimen	Constructed in 1911-1912 on a triangular lot facing Galindo and Salvio Streets. The two-story mission-style architecture was notable as one of the first "modern" structures to replace wooden buildings in the downtown area. Owners were prominent in business and government.
CONCORD AREA	PERRY HOUSE 1990 Concord Avenue Incorporated	1990 Concord Ave	Concord	CA	94520	Structure of Historical Significance	Originally located on Clayton Road off Colfax, the house was built in 1911 by its owner, Lawrence V. Perry, who constructed a number of other notable buildings in Concord.
CONCORD AREA	KELLER HOUSE 1760 Clayton Road Incorporated	1760 Clayton Rd	Concord	CA	94520	Structure of Historical Significance	The house was built just before the turn of the century for Charles and Elodia Keller. After about 10 years they bought and moved to a larger ranch in Clayton. Charles' younger brother, Paul, moved in with his wife. Founder of P.L. Keller which later became Keller Hardware. Paul was active in the community and renowned for his interest in and love of plants. Moved out of its downtown redevelopment area to its present site in Ellis Lake Park in 1984.
CONCORD AREA	MALTHY MOUND	1858 St Phillip Ct	Concord	CA	94519	Site of Historic Event	The site of an Indian Village on the Malthy Ranch on the east side of Concord. Was one of the largest in the Concord area and was located about 1908. The site was not recorded until 1937 when Mr. Ernest Johnson informed the University of California.
CONCORD AREA	ELWORTHY-KELLER HOUSE 2156 Pacheco Street Incorporated	2156 Pacheco St	Concord	CA	94520	Structure of Historical Significance	A simple cottage of the late Victorian era. Notable are the fish scale shingles on the gables, beveled siding and fanciful millwork. Residence of two prominent families before each had built larger, more expensive homes.
CONCORD AREA	NUNEZ HOUSE 2334 Almond Avenue Incorporated	2334 Almond Ave	Concord	CA	94520	Structure of Historical Significance	Mr. Nunez operated a saloon on the west side of the house which was originally located on the south side of Salvio Street between Grant and Colfax. The house was apparently built in the 1890s and is distinctive in being the fullest expression of the then popular Queen Anne style.

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CONCORD AREA	MT. DIABLO HIGH SCHOOL 2455 Grant Street Incorporated	2455 Grant St	Concord	CA	94520	Structure of Historical Significance	The area's first high school when voters formed the Mt. Diablo Union High School District in 1901. A.W. Malthy donated the land, a 3.5-acre parcel, bordered by Grant and East Streets. The first building in use from 1905 to 1963 when it was razed. To protect the locale of Concord's first of many high schools, the site was designated a Concord Historical Landmark.
DIABLO AREA	DIABLO HISTORIC DISTRICT This includes the entire Diablo area.	District. Diablo, CA				Site of Historical Significance	The area of Diablo is acknowledged as being an area of historical significance with numerous historical buildings within the area. The Oakwood Stock Farm is a point of historical interest within the area.
DIABLO AREA	1926 ALAMEDA DIABLO (Former Diablo Country Club Clubhouse)	1926 Alameda Diablo	Diablo	CA	94528	Structure of Historical Significance/Architectural Specimen	The building was originally constructed on the site of Railroad Ranch, a large estate established in the 1870s by the owners of the Central Pacific railroads and served as headquarters of the ranch. The building was occupied as a residence in 1889 by Louise Cook Arner and her family. She was a famous American explorer of the Arctic and was the first woman to fly over the north pole. The building was later used as an inn and clubhouse for the Mount Diablo Park Club from 1912 to 1948, which was an exclusive residential park. The building was converted and used as a private residence from 1948 to the present after the construction of the new Country Club Clubhouse.
EAST CONTRA COSTA COUNTY AREA	BETHEL ISLAND FIRE STATION 3045 Ranch Lane, Bethel Island	3045 Ranch Lane	Oakley	CA	94561	Structure of Historical Significance/Architectural Specimen	The fire station was stated to be one of the oldest structures on Bethel Island. It is comprised of a Quonset hut metal building constructed on site circa 1951 with a flat-roofed masonry addition along the front of the building. This building is an example of a pre-fabricated shelter system developed in 1941, originally designed to provide housing for troops during WWII which was later converted after the war for civilian use. The fire station is locally known to be an important early community building, and the first permanent fire station in Bethel Island that housed a fire engine.
EAST CONTRA COSTA COUNTY AREA	EUGENE A. BRIDGFORD HOUSE 4090 Gateway Road, Bethel Island	4090 Gateway Rd	Bethel Island	CA	94511	Structure of Historical Significance/Architectural Specimen/Individual	The Eugene A. Bridgford House was originally located ¼ mile west on Gateway Road, but was relocated to the subject property due to the construction of the Delta Coves subdivision in Bethel Island. The house was originally built from 1913-1916 as a two-story 7,200 square-foot Prairie style residence for Judge Eugene A. Bridgford, a former state legislator, former judge, and successful San Francisco lawyer. He was involved in the reclamation district that encompasses Bethel Island and organized agricultural production on the island.
EAST CONTRA COSTA COUNTY AREA	PRESTON HOUSE Byron Highway near Marsh Creek Road Byron	25987 Marsh Creek Rd	Brentwood	CA	94513	Structure of Historical Significance/Architectural Specimen	Built in 1870 and home of one of the early pioneers. A Victorian-style structure.
EAST CONTRA COSTA COUNTY AREA	BYRON HOT SPRINGS HOTEL Springs Road near County Road J4 Byron	5400 Byron Hot Springs Rd	Byron	CA	94514	Structure of Historical Significance	Center of recreation and health spa in the San Francisco Bay Area in the late 1880s and early 1900s. It has burned down twice. Mud baths, hotel, manager's house and cottages are still there. It was a Japanese prison camp during World War II.
EAST CONTRA COSTA COUNTY AREA	BYERS HOUSE Byers Lane Byron	3275 Byer Rd	Byron	CA	94514	Structure of Historical Significance	Built in the 1860s and home of one of the early pioneers.
EAST CONTRA COSTA COUNTY AREA	PARISH HOUSE OF METHODIST CHURCH Byron	14761 Byron Hwy	Byron	CA	94514	Structure of Historical Significance	Circuit rider house built in 1850s.

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EAST CONTRA COSTA COUNTY AREA	POINT OF TIMBER LANDING Indian Slough off Old River, Byron	37°54′58″N 121°36′18″W	Discovery Bay	CA	94505	Site of Historic Event	Site of warehouse, lumber yard, shipping point for grain harvested in vicinity.
EAST CONTRA COSTA COUNTY AREA	POINT OF TIMBER TRADING CENTER East of Union Cemetery, Point of Timber Road and Highway 4, Byron	11980 Byron Hwy	Brentwood	CA	94513	Site of Historic Event	Site of Wolf and Kahn Store, Lehman and Davis Blacksmith Shop, and post office 1869 to 1882.
EAST CONTRA COSTA COUNTY AREA	BYRON GRANGE HALL Southwest corner of Marsh Creek Road and Highway 4 Byron	Marsh Creek Rd and Vasco Rd	Brentwood	CA	94513	Site of Historic Event	Built in 1873, it housed the Grange at the Town of Point of Timber. The town folded in 1878 with the coming of the Southern Pacific Railroad and the building was moved to Byron.
EAST CONTRA COSTA COUNTY AREA	BYRON I.O.O.F. HALL 3978 Main Street Byron Unincorporated	3978 Main St	Byron	CA	94514	Structure of Historical Significance	Earliest I.O.O.F. hall in the area. Built in 1870. It was the social center through the early 1900s. It is still used and is in good condition.
EAST CONTRA COSTA COUNTY AREA	FRY HOUSE Byer Lane Byron					Structure of Historical Significance	"TO BE DOCUMENTED"
EAST CONTRA COSTA COUNTY AREA	JEWETT HOUSE 600 First Street Byron	600 1st St	Byron	CA	94514	Structure of Historical Significance	"TO BE DOCUMENTED"
EAST CONTRA COSTA COUNTY AREA	VASCO CAVES South of Byron Hot Springs Road Byron	Byron Hot Springs Rd and Holey Rd	Byron	CA	94514	Site of Historic Event	Vasco Caves was a hide-out of Joaquin Murietta, an infamous bandit.
EAST CONTRA COSTA COUNTY AREA	BABBE'S LANDING Foot of Seller Road on Dutch Slough Oakley	7104 Sellers Ave	Oakley	CA	94561	Site of Historic Event	Early boat landing for horse and hay transport to San Francisco. Site of store of Martin Hamburg. Shipping site for Iron House and Eden Plains area.
EAST CONTRA COSTA COUNTY AREA	GEDDES HOUSE Marsh Creek Road, west of Highway 4 Brentwood	Marsh Creek Rd and Vasco Rd	Brentwood	CA	94513	Structure of Historical Significance/Architectural Specimen	Built in 1870 by one of the early settlers in the area. A two-story structure of Victorian style.
EAST CONTRA COSTA COUNTY AREA	IRON HOUSE SCHOOL Cypress Road and Sellers Avenue, Brentwood	975 E Cypress Rd	Oakley	CA	94561	Structure of Historical Significance	Early school built in 1850s. Now used as a residence.
EAST CONTRA COSTA COUNTY AREA	McCABE HOUSE Byron Highway at end of Brent-wood Road, Brentwood	12200 Byron Hwy	Brentwood	CA	94513	Structure of Historical Significance/Architectural Specimen	Home of one of the early pioneers, circa 1860. A much decorated Victorian-style structure with patterned wood shingles and spindle and spool ornamentation.
EAST CONTRA COSTA COUNTY AREA	MURPHY HOME 800 Railroad Avenue, Brentwood	800 Railroad Ave	Brentwood	CA	94514	Structure of Historical Significance/Architectural Specimen	Home of early resident in the area and built around 1909. A Victorian-style structure.
EAST CONTRA COSTA COUNTY AREA	WALLACE HOME 828 Railroad Avenue, Brentwood	38.028727° lat, -121.883884° long	Brentwood	CA	94515	Structure of Historical Significance/Architectural Specimen	Home of early resident in the area and built around 1909. A Victorian-style structure.
EAST CONTRA COSTA COUNTY AREA	COATS HALL Highway 4 near Oak Street, Brentwood					Structure of Historical Significance	An early mansion in Brentwood built in the 1850s. Now used as a hotel and restaurant.
EAST CONTRA COSTA COUNTY AREA	LIBERTY GRAMMAR SCHOOL Deer Valley and Marsh Creek Roads, Brentwood	17701 Marsh Creek Rd	Brentwood	CA	94512	Site of Historic Event	The site of an early grammar school in the area.
EAST CONTRA COSTA COUNTY AREA	JUDGE WALLACE CHAMBERS 300 Oak Street, Brentwood	300 Oak Street	Brentwood	CA	94513	Structure of Historical Significance	One of the oldest buildings in Brentwood and used as Judge Wallace's chambers.

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EAST CONTRA COSTA COUNTY AREA	JOHN MARSH HOME Marsh Creek Road 2-½ miles south of Brentwood	21789 Marsh Creek Rd	Brentwood	CA	94513	Structure of Historical Significance/Architectural Specimen	John Marsh, doctor and first Anglo-American settler in Contra Costa County, was born June 5, 1799, in Danvers, Massachusetts, pioneered westward and eventually bought the Rancho Los Meganos (13,316 acres) from Jose Noriega. He married Abby Tuck in 1851 and in 1852 started the mansion for his bride. The mansion, known as the "Stone House," was completed in 1856; however, it was never lived in by the Marshes. Abby died in 1855 and John was murdered September 24, 1856. The home is listed on the National Register of Historic Places.
EAST CONTRA COSTA COUNTY AREA	"ARBOR" Lone Tree Way at Southern Pacific Railroad Tracts	7021 Lone Tree Way	Brentwood	CA	94513	Site of Historic Event	Although no longer in existence, in 1920 this area was a vital agricultural shipping center known as "Arbor." The focal point of Arbor was the Lone Tree Shipping Company founded in 1926 by Charles Douglas. The shipping company, located on the south side of Lone Tree Way, just east of the tracts, was a cooperative consisting of packing sheds, a large drying yard, and a spur line. The Arbor store and service station were located across Lone Tree Way. Although a residence exists on this site today, remnants of the service station still remain.
EL CERRITO AREA	ALLINIO HOUSE 609 Kearny Street Incorporated	609 Kearney St	El Cerrito	CA	94530	Structure of Historical Significance/Architectural Specimen	This house, constructed circa 1908 by Mr. Allinio, was one of the first two houses upon which stucco was used. Also, the location of the first airplane constructed in the area and the first cockpit plane anywhere.
EL CERRITO AREA	DOWNER HOUSE 5810 Charles Street Incorporated	5810 Charles St	El Cerrito	CA	94530	Structure of Historical Significance/Architectural Specimen	Artisans from Berkeley camped in tents on this hillside while constructing this home for Eddie Downer, founder of Mechanics Bank. Structure is of Spanish and Moorish design and has the boiler of a railroad locomotive in the basement to provide heat.
EL CERRITO AREA	GEORGE FRIEND ESTATE 1101 Arlington Incorporated	1101 Arlington Blvd	El Cerrito	CA	94530	*Architectural** Specimen	"TO BE DOCUMENTED"
EL CERRITO AREA	GILL ESTATE 801 Bates Avenue Incorporated	801 Bates Ave	El Cerrito	CA	94530	Architectural* Specimen	A unique styled mansion located on a promontory overlooking the Bay Area. The structural features include a tower, exterior chimney, large bays with windows, a tiled high gabled roof and a gabled entrance.
EL CERRITO AREA	NAVELLIER HOME 1332 Navellier Street Incorporated	1332 Navellier St	El Cerrito	CA	94530	Structure of Historical Significance	Structure constructed in 1898. Home of one of El Cerrito's former councilmen and Judge in the 1930s.
EL CERRITO AREA	SOLDAVINI HOME 11440 San Pablo Avenue	11440 San Pablo Ave	El Cerrito	CA	94530	Structure of Historical Significance	Structure built about 1912. Home of the proprietor of the first hardware store in El Cerrito located at the same site.
EL CERRITO AREA	BONINNI HOUSE 1710 Liberty Street Incorporated	1710 Liberty St	El Cerrito	CA	94530	Structure of Historical Significance	Structure built in 1907 for one of El Cerrito's pioneering Italian families.
EL CERRITO AREA	JOAQUIN MURIETTA ROCK Arlington and Cutting Boulevards	7120 Cutting Blvd	El Cerrito	CA	94530	Site of Historical Event	An outcropping of rock covering about an acre is the subject of field trips from the University of California. Legend has it that it was a hiding place for bandits who robbed the stagecoaches on the flat lands below. The rock outcropping is of the Franciscan type, and is over 150 million years old.

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EL CERRITO AREA	VICTOR CASTRO ADOBE 1 El Cerrito Plaza Incorporated	1 El Cerrito Plaza	El Cerrito	CA	94530	Site relating to Important Person in History/Site of Historic Event	Don Victor Ramon Castro, one of thirteen children of Don Francisco Castro, chose the very edge of his father's 17,938 acre Rancho San Pablo for his adobe hacienda in 1839. The adobe extended into a U-shape Spanish style home with two wings and a patio. A frame second story was added in the 1850s with an upper and lower veranda on the front or west side. In places the outer walls were 44 inches thick and partition walls 36 inches thick. The adobe was considered one of the most beautiful in California. The adobe was destroyed by fire in 1956. The adobe site is a California Historical Landmark #356.
KNIGHTSEN AREA	ORIGINAL KNIGHTSEN TOWNSITE AREA a.k.a. Downtown Knightsen This area includes all of the properties identified as the "Town of Knightsen" in Book 20, Page 7 of the County Assessor's Map	District. 79 1st St.	Knightsen	CA	94548	Site	The Knightsen Townsite is important to the overall history and settlement of Eastern Contra Costa County. The settlement of Knightsen was closely tied to the Knightsen Train Stop and rail yard. Included in the Knightsen Townsite are a number of single-family residences and commercial buildings that are the original buildings constructed in the early 1900s, which includes the Knightsen Post Office, Knightsen Farm Center Building (1921), Knightsen Saloon (1900), and the Duff Store and first telegraph building (1925).
KNIGHTSEN AREA	NAIL RANCH PROPERTY					Building of significance	The Nail family settled in the Knightsen area in the 1860s and constructed a small home on the property. A second Nail residence was constructed on the property in the 1870s. The Nail family was one of the earliest families to settle in the area. The second Nail residence is a classic example of early Californian farmhouse architecture and has been maintained over time and is in good condition. The East Contra Costa Historical Society uses the second Nail residence and a number of other structures on the property as a museum.
LAFAYETTE AREA	PLAZA PARK Mt. Diablo Boulevard and Moraga Road	3537 Plaza Way	Lafayette	CA	94549	Site relating to Important Person in History	Park Plaza was deeded to the citizens of Lafayette November 19, 1864, by Elam Brown, owner of Rancho Acalanes, founder of Lafayette and second Anglo-American settler in Contra Costa County. This small public park has a millstone from Elam Brown's gristmill on permanent display. Park designated in 1970 as a California Point of Historical Interest, CCo-3 and named Lafayette landmark by a City Council Resolution (36-76) in 1976.
LAFAYETTE AREA	WAY SIDE INN 3521 Golden Gate Way Incorporated	3521 Golden Gate Way	Lafayette	CA	94549	Structure of Historical Significance	Built in 1894 by Edward J. Brady as a tavern and later became an inn and stage coach stop. Site noted as a local historic point of interest by plaque. Named a Lafayette landmark by a City Council Resolution (36-76) in 1976.
LAFAYETTE AREA	PIONEER STORE 3535 Plaza Way Incorporated	3535 Plaza Way	Lafayette	CA	94549	Structure of Historical Significance	Benjamin Shreve, first school teacher and postmaster in Lafayette, built the Pioneer Store, circa 1860. Mr. Schreve named the town of Lafayette. Site noted as local historic point of interest by plaque and named a Lafayette landmark by a City Council Resolution (36-76) in 1976.
LAFAYETTE AREA	GEILS BUILDING 3531 Plaza Way	3531 Plaza Way	Lafayette	CA	94549	Structure of Historical Significance	Fred Geils built the structure as a saloon in 1880. Site is located in same district as Way Side Inn and Pioneer Store. Site noted as local historic point of interest by plaque.

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LAFAYETTE AREA	OLD LAFAYETTE GRAMMAR SCHOOL – METHODIST CHURCH 957 Moraga Road Incorporated	957 Moraga Rd	Lafayette	CA	94549	Structure of Historical Significance	Built in 1893 as a grammar school, the third school house built in town. Served as a school until 1927 when it was purchased by Methodist Church. Site noted as local historic point of interest by plaque and named a Lafayette landmark by a City Council Resolution (85-83) in 1983.
LAFAYETTE AREA	TOWN HALL School Street and Moraga Road	3535 School St	Lafayette	CA	94549	Structure of Historical Significance	Built in 1914 by volunteer labor and financed by the citizens as a town hall. Now used by the dramateurs for little theatre productions. Named a Lafayette landmark by a City Council Resolution (33-78) in 1978.
LAFAYETTE AREA	DALEY HOUSE 3306 Moraga Blvd Incorporated	3306 Moraga Blvd	Lafayette	CA	94549	Structure of Historical Significance	The house is believed to be the oldest house still standing in Lafayette. County records show the existence of this structure in 1869.
LAFAYETTE AREA	COMSTOCK BRONSTON HOUSE 811 Topper Lane Incorporated	811 Topper Ln	Lafayette	CA	94549	Structure of Historical Significance	The first house on St. Mary's Road, built in 1866. Center core of the structure remains as it was originally built. Several additions have been made to the small, two-story house. Miss Comstock, village dressmaker, and her widowed sister, Mrs. Bronston, first lived here.
LAFAYETTE AREA	ELAM AND MARGARET BROWN HOUSE 985 Hough Avenue	985 Hough Ave	Lafayette	CA	94549	Site relating to Important Person in History	Circa 1847, Elam Brown, founder of Lafayette, second American settler in Contra Costa County and early pioneer, built his home by the creek on Hough Avenue. A monument bearing a plaque was placed here by the Lafayette Historical Society in 1981.
LAFAYETTE AREA	ELAM BROWN'S GRIST MILL Golden Gate Way adjacent Park Theater	3491 Mt Diablo Blvd	Lafayette	CA	94549	Site relating to Important Person in History	Built in 1853 by Elam Brown near the center of the valley, the grist mill was the only one in the whole area and farmers came from many miles away to use it. The mill was powered by horses.
LAFAYETTE AREA	ALAMO-LAFAYETTE CEMETERY Mt. Diablo Boulevard	3285 Mt Diablo Blvd	Lafayette	CA	94549	Site relating to Important Person in History/Site of Historic Event	In 1874 Lafayette pioneers bought four and one-half acres on a hillside at the east end of town on Mt. Diablo Boulevard for $100. They formed a cemetery corporation with Elam Brown as chairman. The original Death and Burial Record Book is still on file in the caretakers building. In 1937 a district was formed to insure perpetual care. The cemetery was named and plaqued as a site of historical interest by the Lafayette Historical Society in 1979.
LAFAYETTE AREA	GARRETT BUILDING 3565 Mt. Diablo Boulevard Incorporated	3565 Mt Diablo Blvd	Lafayette	CA	94549	*Architectural** Specimen	A one-story brick structure with bellcast gable roof of slate shingle reminiscent of English architecture.
LAFAYETTE AREA	FRIENDSHIP FARM 3350 Woodland Way Incorporated	3350 Woodland Way	Lafayette	CA	94549	*Architectural** Specimen	Built in 1912 by Miss Sally Hampton, a Southerner, and Miss Mary (Millie) Dyer, a New Englander. Structure features both the Southern and New England influence in its colonial design. A water tower (now a bedroom), creek, beach and garden enhance this site.
LAFAYETTE AREA	LOCUST TREES East side of Happy Valley Road	2 Lois Ln	Lafayette	CA	94549	Site of Historic Event	Three-quarters of a mile up Happy Valley Road, early settlers planted 10 locust trees which now contribute toward beautifying the area. These trees could be classified as "Heritage Trees."
LAFAYETTE AREA	ARTHUR T. BURTON RESIDENCE 549 Arrowhead Drive Incorporated	549 Arrowhead Dr	Lafayette	CA	94549	Site relating to Important Person in History	Arthur Burton, a gold miner, in partnership with John Grant and later a secretary of the Moraga Land Association which owned 12,605 acres, lived in this home from 1887 to the time of his death in 1925.

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LAFAYETTE AREA	FELIPE BRIONES ADOBE Intersection of New Briones Dam Road and Old Bear Creek Road	16 Bear Creek Rd	Lafayette	CA	94549	Site relating to Important Person in History	Felipe Briones petitioned for the Rancho La Boca de la Canada del Pinole in 1839. He lived there for 10 years and maintained his family of eighteen persons in the adobe. The land was granted to Felipe's widow Dona Maria Manuela Valencia on June 21, 1842, by Governor Alvarado.
LAFAYETTE AREA	JAMES BICKER-STAFF HOME 3615 Mt. Diablo Boulevard Incorporated	3615 Mt Diablo Blvd	Lafayette	CA	94549	Site of Historic Interest	Diablo Foods Market on the site. The redwood tree in front of the market was planted by James Bickerstaff's daughter, a pioneer school teacher in this locality.
LAFAYETTE AREA	SACREMENTO-NORTHERN RAILROAD					Site of Historic Interest	This route is now used as a hike and bike trail.
MARTINEZ AREA	JOHN MUIR HOME 4202 Alhambra Avenue Incorporated	4202 Alhambra Ave	Martinez	CA	94553	Structure of Historical Significance/*Architectural** Specimen	Dr. John Strentzel, noted horticulturist, built this 17 room Victorian mansion in 1882. In 1890 it became the home of Strentzel's son-in-law, John Muir, noted conservationist and author. John Muir lived here the last 24 years of his life and wrote many books that had profound effect on conservation and the national system of forests and parks. The home, known as the John Muir home, is now owned by the National Park Service and has been restored to the 1906-1914 era. In recognition of John Muir's contribution to the nature lore of our nation, President Johnson signed a measure in 1964 that established the John Muir National Historic Site on the National Register of Historic Places. Also designated as a California Historical Landmark #312.
MARTINEZ AREA	VINCENTE MARTINEZ ADOBE 4202 Alhambra Avenue Incorporated	4202 Alhambra Ave	Martinez	CA	94553	Structure of Historical Significance/*Architectural** Specimen	In 1849, Vincente Martinez built this adobe which still stands as a reminder of the County's original 57 historic adobes and one of Contra Costa County's oldest Spanish dwellings. The Adobe is part of the John Muir National Historic Site. Other owners of the property included Edward Franklin (1853) after whom Franklin Canyon was named, then Thomas Redfern and later Dr. John Strentzel (1874) whose daughter would later become Mrs. John Muir. It has been stated that the Martinez adobe with its two-story wooden veranda typifies New England-influenced California architecture of the 1840s. California Historic Landmark #511.
MARTINEZ AREA	JOHN SWETT RANCH (HILL GIRT RANCH) Alhambra Valley Road	141 Hill Girt Ranch St	Martinez	CA	94533	Structure of Historical Significance	Home of John Swett, "father of education in California," consisted of 171 acres which he bought originally as a summer home. The Altamirano adobe was part of the purchase. Later Mr. Swett built a 19-room home on the property.
MARTINEZ AREA	BURIAL SITE OF JOHN MUIR Strentzel Lane Unincorporated	4202 Alhambra Ave	Martinez	CA	94553	Site relating to important person in history	Gravesite of John Muir, famous conservationist and author.
MARTINEZ AREA	GRANGERS WHARF Martinez Waterfront Incorporated	On Google Maps: "Grangers Wharf"				Site of Historic Event	In 1876, the wheat and fruit growers built a wharf for handling their shipments. It was also the site of an Italian fishing port. Some original pilings still remain along with evidence of washing tanks for fishnets.
MARTINEZ AREA	MARTINEZ GAZETTE BUILDING Main and Court Streets Incorporated	625 Court St	94553			Structure of Historical Significance	Past home of Martinez Gazette, one of California's first newspapers in continuous publication since 1858.
MARTINEZ AREA	BUNKER HOME 235 Marina Vista Incorporated	235 Marina Vista	Martinez	CA	94553	Structure of Historical Significance	Built in 1877 by the publisher of the Martinez Gazette, R.R. Bunker. The structure is presently being restored.

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MARTINEZ AREA	TENNET HOME Talbart and Escobar Streets Incorporated	608 Talbart St	Martinez	CA	94553	Structure of Historical Significance/*Architectural** Specimen	Dr. John Tennet, son of Dr. S. Tennet of Pinole, built this Victorian-styled structure in 1888. The 2-½-story home has a high hip roof and a tower extends first and second story topped by a turret shaped roof. Main floor is elevated over a full basement.
MARTINEZ AREA	TUCKER HOME Talbart and Escobar Streets Incorporated	110 Escobar St	Martinez	CA	94553	Structure of Historical Significance/*Architectural** Specimen	Circa 1880, a sea captain named Tucker built this Victorian home which is now being restored by its owners. This two-story structure has a truncated roof, a full basement and an open veranda with decorated pillars. Window detail is segmental with decorated labels.
MARTINEZ AREA	PAUL'S PLACE 1521 Alhambra Avenue	1521 Alhambra Ave	Martinez	CA	94553	Structure of Historic Significance/ *Architectural** Specimen	A Victorian home built by Kelly in 1877. The exterior Victorian styling has been maintained although the interior has been altered and used as a restaurant since 1930.
MARTINEZ AREA	WITTENMYER HOME Arreba and Richarson Streets Incorporated	215 Arreba St	Martinez	CA	94553	Structure of Historical Significance	Circa 1890, Lewis Cass Wittenmyer built this home. Wittenmyer was County Clerk in 1876 and instrumental in the incorporation of Martinez as a city in that year.
MARTINEZ AREA	STEWARTS GROCERY Castro and Ward Streets	800 Castro St	Martinez	CA	94553	Structure of Historical Significance/*Architectural** Specimen	Circa 1879, James Stewart built this general grocery and fruit store and engaged in mercantile pursuits after many years of farming. A western-style structure with false front, low gable roof and a stepped parapet for roof trim.
MARTINEZ AREA	SOUTHERN PACIFIC RAILROAD DEPOT Incorporated	401 Ferry St	Martinez	CA	94553	Structure of Historical Significance	Circa 1876, work started on the railroad and on September 25, 1877, the first passenger train with Leland Stanford aboard went through Martinez.
MARTINEZ AREA	ALTAMIRANO ADOBE Alhambra Valley Road	295 Millthwait Drive	Martinez	CA	94553	Structure of Historical Significance/*Architectural** Specimen	Circa 1840, Abelino Altamirano built this adobe with its three foot thick walls. It is considered one of California's finest. John Swett, founder of California's public school system, bought the adobe in 1881.
MARTINEZ AREA	SITE OF JOHN MARSH MURDER 4500 block Pacheco Boulevard Unincorporated	4500 Pacheco Blvd	Martinez	CA	94553	Site relating to important person in history	Site where John Marsh, first American settler and owner of Rancho Los Meganos, was killed by three vaqueros, his former employees on September 24, 1856. Motive was said to be a wage dispute. It was ten years before two of the culprits were caught and tried. The third never was brought to justice. A plaque and monument dedicate the site. California Historical Landmark #722.
MARTINEZ AREA	COUNTY COURT HOUSE Main and Court Streets Incorporated	725 Court Street	Martinez	CA	94553	Site of Historic Event	Original court house for Contra Costa County was built in 1855. It faced Escobar Street and the Carquinez Strait. It has a bell, cast in New York and carried around Cape Horn by a sailing vessel. Original structure was replaced in 1901 by what is now the County Finance Building.
MARTINEZ AREA	MARTINEZ CEMETERIES Carquinez Scenic Drive West of Martinez Incorporated	211 Foster St	Martinez	CA	94553	Site relating to important person in history	Earliest burial ground in the County. Many notable pioneers, including Salvio Pacheco, Fernando Pacheco, the Martinez family, Joseph Reddeford Walker and Elam Brown, are interred here. Catholic Cemetery is on south side of road and Protestant on the north.
MARTINEZ AREA	MARTINEZ-BENICIA FERRY LANDING Foot of Barrellesa Street on Carquinez Strait Incorporated	310 Embarcadero St	Martinez	CA	94553	Site of Historic Event	Site of original ferry crossing established by Robert Semple of Benicia in 1847. It was a principal crossing for 49ers on their way to the mining areas. When the shoreline silted up, the landing for the ferry was shifted east to what became Ferry Street. In1860, the first westbound pony express rider crossed here in route to Oakland.

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MARTINEZ AREA	BERRYESSA ADOBE Escobar and Alhambra Avenue	427 Escobar St	Martinez	CA	94553	Site of Historic Event	Circa 1850, Jose del los Santos Berryessa built his adobe at this site. His wife was Francisca Martinez, daughter of Ignacio Martinez, grantee of Rancho El Pinole. Before the court house was built the second floor was used for County business. First meeting of Martinez Masonic Lodge was held here in 1854.
MARTINEZ AREA	FERNADALE SPRINGS Alhambra Valley Road Vaca Canyon	5830 Alhambra Valley Rd	Martinez	CA	94553	Site of Historic Event	Site of picnic and social center for prominent citizens of the late 1800s. Encompassed 160 acres with hotel and cottages. Resort offered mineral baths of soda, sulphur, and magnesia water as "cure" of rheumatism and other ills.
MARTINEZ AREA	ALHAMBRA SPRINGS RESORT West end of Alhambra Valley					Site of Historic Event	Site of popular resort in late 1800s where people came to bathe and drink mineral waters. In 1900 bought by L.M. Lasell who in 1905 laid a pipeline from the resort to a bottling plant opposite the railroad depot in Martinez and sold "Alhambra Pure Spring Water."
MARTINEZ AREA	ALHAMBRA HIGH SCHOOL 921 Susana St. Incorporated	921 Susana St.	Martinez	CA	94553	Site of Historic Event/ Site relating to important person in history	School classes were held from 1902 to 1921 in the imposing two-story wood structure once on this site. John T. Swett was a member of board of trustees. Site is now occupied by offices of Martinez Unified School District.
MARTINEZ AREA	BORLAND HOME Corner of Court and Escobar Streets Incorporated	1005 Escobar Rd	Martinez	CA	94553	Structure of Historical Significance	Built by Dr. J.S. Moore, D.D.S., in 1890, and left to his daughter who married into the Borland family. Later used as a rental and then became the C.C.C. Community College District Office. Became Martinez Museum in 1973.
MORAGA AREA	THE JOHN COURTER STORE OR MASON'S STORE SITE Larch Avenue and Canyon Road	1003 Larch Avenue	Moraga	CA	94556	Site of Historic Event	Site of a two-story structure built in 1854. Known as John Courter Store or Mason's Store. The two business partners served the needs of travelers as well as residents (teamsters and lumberjacks) working the nearby redwood forests. The structure housed a general merchandise store in front, a saloon at the rear and rooming accommodations upstairs. Structure lasted into the 1920s.
MORAGA AREA	WILLOW SPRING SCHOOL SITE Junction Canyon, Moraga, St. Mary's Road	1455 St Marys Rd	Moraga	CA	94556	Site of Historic Event	The first school erected in the Moraga Valley in 1855. It was incorporated into the County school system in 1857. The school was abandoned in 1918, then moved to the Moraga Company Ranch as a recreation hall for resident laborers. It burnt down in the 1940s. However, the old school bell is preserved in the cupola of the Moraga Ranch Mess Hall which is now a commercial establishment.
MORAGA AREA	ST. MARY'S COLLEGE 1928 St. Mary's Road	1928 St. Mary's Rd.	Moraga	CA	94575	Structure of Historical Significance	One of the oldest colleges in the west being dedicated in San Francisco in 1863. The first 100 acres were donated by James Irvine, President of the Moraga Company. Incorporated and empowered to confer degrees in 1872. Moved to Oakland in 1889 then to Moraga in 1928.
MORAGA AREA	RHEEM ESTATE OR HACIENDA DE LAS 2100 Donald Drive	2100 Donald Dr	Moraga	CA	94556	Structure of Historical Significance/*Architectural** Specimen	The Rheem Estate, designed by architect Clarence Tantau. The first floor as seen from the front was built in 1916 or 1917 as an orphanage to be directed by the Misses Hortense Higgens and Gertrude Mallelle. Ms. Higgens sold the structure and 20 acres to Donald Rheem in 1934. The main structure included 18 rooms excluding bathrooms and is a Spanish-styled hacienda. The pool house has additional bedrooms, changing rooms, and entertainment room with an upstairs projection room. The structure now serves as the Community Center for Moraga.

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MORAGA AREA	MORAGA BARN 1002 Viader Drive	1002 Viader Dr	Moraga	CA	94556	Structure of Historical Significance	Structure built around 1913 or 1914 and first owned by the Talbots, then Springmeyer, then Fleuti. The barn is remembered as a bar, but was utilized as a hotel, mercantile store and during the Depression, the post office.
MORAGA AREA	MORAGA CANYON LUMBER MILL Redwood Regional Park					Site of Historic Event	Now part of East Bay Municipal Utility District's holding of the "Moraga Grove of Redwoods," this site once was the site of early redwood lumber mills such as the Prince's Mill on Redwood Creek.
MORAGA AREA	DAVID CARRICK HOUSE Moraga Road	1204 E 15th St	Oakland	CA		Structure of Historical Significance	This is thought to be the oldest structure in Moraga. In 1911 or 1912, it was moved across the right-of-way and old "Moraga Road" in anticipation of the laying of the tracks for the Oakland and Antioch Railroad. The original rooms are the parlor, kitchen and two bedrooms.
NORTH COAST AREA	OLEUM Between Pinole and Crockett on the west Side of State Highway 80					Structure of Historical Significance	Construction of the Union Oil Company's refinery at Oleum was started in 1895. By 1897, the Contra Costa News described it as the "largest establishment of its kind on the coast." First oil refinery in Contra Costa County.
NORTH COAST AREA	TOWN OF PORT COSTA Located on Carquinez Strait Between Crockett and Martinez	38.046421° lat, -122.183634° long	Port Costa	CA	94569	Site of Historic Event/ Site relating to important person in history/a Historic District	Site of an early transportation route between Oakland and Sacrament. In 1879 the Central Pacific Railroad built a line to Bull Valley (Port Costa). From there the trains were ferried across the Carquinez Strait to Benicia for onward movement by rail to Sacramento. The same year a wheat merchant, George W. McNear, acquired a large strip of land at this site of Bull Valley and along the straits and laid out the Town of Port Costa. By 1887, warehouses and wharfs at this site handled four-fifths of the wheat shipped from California. California Point of Historic Interest CCo-2.
NORTH COAST AREA	BURLINGTON HOTEL Canyon Lake Dr., Port Costa	2 Canyon Lake Drive	Port Costa	CA	94569	Structure of Historical Significance/ Port Costa Historic District/*Architectural** Specimen	Built in 1909, this three-story wood structure with bay windows commands a magnificent view across Carquinez Strait. Built as a hotel to accommodate travelers. The structure deteriorated in the late 1920s when the grain shipments from this area ended. Restoration was completed by the present owners in 1973.
NORTH COAST AREA	PORT COSTA GRAIN WHAREHOUSE Canyon Lake Drive, Port Costa	3 Canyon Lake Drive	Port Costa	CA	94569	Structure of Historical Significance/Port Costa Historic District	In 1886 George McNear built a fireproof warehouse for the purpose of storing hay and produce. This 100' x 100' structure was built between the Burke Hotel and the railroad. It is presently used as an antique shop, restaurant and bar.
NORTH COAST AREA	PORT COSTA MERCANTILE Canyon Lake Drive, Port Costa	17 Canyon Lake Drive	Port Costa	CA	94569	*Architectural** Specimen/Port Costa Historic District	An early western-styled structure with a false front and bay windows at the second story. Front of structure has been restored to original appearance of Port Costa.
NORTH COAST AREA	WHEAT DOCK Canyon Lake Drive, Port Costa	11 Canyon Lake Drive	Port Costa	CA	94569	*Architectural** Specimen/Port Costa Historic District	An early western-styled structure with false front and open veranda at second story. Structure adds to the historic appearance of Port Costa.
NORTH COAST AREA	BULL VALLEY INN Canyon Lake Drive	14 Canyon Lake Drive	Port Costa	CA	94569	*Architectural** Specimen/Port Costa Historic District	Built in 1897, this two-story stone front building with mansard roof contributes to the various architectural specimens that are part of the history of Port Costa.

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NORTH COAST AREA	PORT COSTA GRAIN WAREHOUSES Carquinez Strait between Crockett and Port Costa	166 Carquinez Scenic Dr	Crockett	CA	94525	Site of Historic Event	From 1876 to 1883, six warehouses were built in what is knows as the Port Costa area of the Carquinez Strait to store grain for shipments worldwide. Twenty-five shiploads per week were handled from this area. Fire of 1889, 1910, and 1924 destroyed several of the warehouses and only two in the Crockett area remain and are used by C & H Sugar refinery.
NORTH COAST AREA	C & H SUGAR COMPANY Crockett on Carquinez Strait	830 Loring Ave	Crockett	CA	94525	Structure of Historical Significance	Built in 1884 as a flour mill. Later used as a wheat storage facility, George McNear bought it in 1894 and sold it in 1897 to California Beet Sugar Company. In 1905 it became a cane sugar refinery called California Hawaiian Sugar Refining Company (C & H).
NORTH COAST AREA	UNION STOCKYARDS Railroad Avenue, Rodeo	633 2nd St	Rodeo	CA	94572	Site of Historic Event	In 1891 the Pinole Packing Company occupied this site and built a hotel, post office, and school. The area was destroyed in 1906 by and earthquake.
NORTH COAST AREA	HERCULES POWDER COMPANY Hercules					Structure of Historical Significance	The site was purchased for a plant from the Martinez family in 1880. At one time it was the largest powder plant anywhere. January 11, 1882, six months after the plant was built, 1500 lbs. of powder exploded, causing the death of one worker. The shock was felt as far as Livermore.
NORTH COAST AREA	SELBY SMELTER Selby-between Oleum & Crockett	2294 Vista del Rio St	Crockett	CA	94525	Site of Historic Event	Built in 1885 by Thomas Selby, a San Francisco hardware Merchant. Ore from all over the world was smelted here. The plant had a tower for making shot. Its smoke stack at one time was reputed as the highest in the United States and was a notable landmark of the area. The plant was closed in 1971 and was subsequently demolished.
NORTH COAST AREA	THE OLD HOMESTEAD Loring Avenue, Crockett	995 Loring Ave	Crockett	CA	94525	Structure of Historical Significance	This, the first Crockett home, was built for Thomas Edwards, Sr., founder of Crockett, circa 1867. Part of the structure was built of imported lumber brought around Cape Horn. California Historic Landmark #731. Operated by the Crockett Women's Club, it is now used for weddings and receptions.
NORTH COAST AREA	LORING AVENUE From West St. to Vallejo Street, Crockett	District. 576 Winslow St.	Crockett	CA	94525	Sites of Historic Events/Structures of Historical Significance	This was the first main street of Crockett which was laid out as a town-ship in 1881 by Thomas Edwards, Sr. Most of the buildings on this street date from 1900 or earlier including the Pickwick Hotel on the southeast corner of Bay and Loring. This hotel was built by Mr. Heald in 1898 for employees of the sugar mill. The hotel has been in constant operation, although its name has been changed many times. The odd Fellows Hall on Loring Avenue between Bay and Heald was also built in the 1880's. This hall has housed most of the town's fraternal organizations. The buildings on Loring Avenue between West and Rolph Avenues were built in 1909 including the Park View Hotel which adjoins Rithet Park.
NORTH COAST AREA	OLD RAILROAD DEPOT					Structure of Historical Significance	Original flag stop for Crockett before it was laid out as a town. Trains stopped coming in 1969. Passengers traveling to Vallejo and Calistoga used to debark at this stop and continue by bus.

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NORTH COAST AREA	TOWN OF VALONA	The whole town. 800 1st Ave.	Crockett	CA	94525	Site of historical Significance	A small town that once occupied the eastern portion of the township of Crockett. Valona was originally laid out by Dr. John Strentzel in 1882, shortly after Thomas Edwards laid out the Town of Crockett. It occupied four square blocks and has easy access to Port Street and the tracks. Dr. Strentzel owned the hill and land on the east side of Crockett Ranch. Valona was a separate town with several stores and a school, although it had no post office or rail stop. Valona was slowly incorporated into the Crockett township.
ORINDA AREA	JOAQUIN MORAGA ADOBE 24 Adobe Lane Incorporated	24 Adobe Ln	Orinda	CA	94563	Structure of Historical Significance	Circa 1841, Joaquin Moraga built this adobe making it the oldest house in the county still standing. Built on a portion of Rancho Laguna de los Palos Colorado, a Mexican land grant to Joaquin Moraga and Juan Bernal in 1835. Restored in 1941 by Mrs. James Irvine. Interior remodeled to private home in 1964 by owner Donald Manuel. California Historical Landmark #509 (1954) and National Register of Historic Places (1972).
ORINDA AREA	CASA VIEJA Casa Vieja Road	4 Casa Vieja	Orinda	CA	94563	Structure of Historical Significance/*Architectural** Specimen	Built in 1894 by Judge James Gartland, an Oakland attorney. This was one of the first purchases of land from the Moraga Land Co. In the Glorietta Area of Orinda. The structure is a two-story wood frame house with a high gable roof and gable dormer. Windows are set in pairs at the front of the structure and there is an open porch centered in the front. The gables have decorated cresting.
ORINDA AREA	OLD MORAGA SCHOOL 200 Block Moraga Way Incorporated	200 Moraga Way	Orinda	CA	94563	Site of Historic Event	The Moraga School District was formed in November 1861. Soon after this school was built on land given by the Moraga family. This was the first school in Orinda and remained open until 1925.
ORINDA AREA	OLD YELLOW HOUSE 209 Moraga Way Incorporated	209 Moraga Way	Orinda	CA	94563	Structure of Historical Significance	Built by Captain Alexander Jenkins in 1894 on a portion of Rancho Laguna de Los Palos Colorados which had been subdivided by Angus Grant, John Grant and James A Williamson. Originally painted the color of old railroad stations, it has been preserved as originally built.
ORINDA AREA	FISH RANCH Gateway Boulevard and Highway 24	100 Gateway Blvd	Orinda	CA	94563	Site of Historic Event	Circa 1872, George Winslow established a ranch to raise fish. Later his son-in-law changed the operation to a more conventional ranch where horses were raised and established a tavern to serve travelers going to and from Oakland. Continued operating until 1915.
ORINDA AREA	HAMPTON'S GRAVE Near Briones Reservoir off Bear Creek Road	37°56'4"N 122°12'2"W	Orinda	CA	94553	Site relating to Important Person in History	Edward J. Hampton 1878-1935, was an electrician of some renown and one of Orinda's early pioneers. He acquired about 300 acres of old Martinez Rancho. He prepared his own gravesite on a high knoll overlooking Orinda. He deeded 70.62 acres of land to Contra Costa County for a public park.
ORINDA AREA	CEDAR OF LEBANON Orinda Community Church Incorporated	10 Irwin Way	Orinda	CA	94563	Site of Historic Event/Site Relating to Important Person in History	The seeds for this Cedar of Lebanon tree were sent to Mr. William Penn Mott, Jr., at his request from the head of the Botanic Garden in Jerusalem. About a dozen seeds were sent and were from the original Cedar of Lebanon grove, the same trees that are referred to in the Bible, outside the City of Jerusalem. The seeds were geminated by the Oakland Park Department nursery. This particular tree was planted in honor of Reverend Fred Marrow in 1955.

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ORINDA AREA	BRYANT STATION Orinda Park Incorporated	22 Bryant Way	Orinda	CA	94563	Site of Historic Event	California and Nevada Railroad began service in 1885 between Emeryville and Berkeley. The line was extended through Albany, Richmond, San Pablo and into Orinda where the line terminated at Bryant Station (named after a resident), circa 1890 located on the east side of Moraga Way near the intersection of Brookwood Road. Railroad bed was extended to Glorietta Avenue on route to Moraga where line was to turn east but the company failed before the tracks were laid, circa 1900. California Point of Historical Interest CCo-1.
ORINDA AREA	SANTA MARIA CHURCH Miner Road and Camino Pablo	315 Camino Sobrante	Orinda	CA	94563	Site of Historic Event/Site Relating to Important Person in History	Built in 1892 by Maria Le Breton de Laveaga as a family chapel and donated to Orinda. Masses were held regularly until 1914 when Miguel de Laveaga died. Church was modeled after San Marie de Bois Church in France and it was a popular subject for both artists and photographers. Congregation moved to a larger church in 1954 and the chapel was demolished in 1955.
ORINDA AREA	ORINDA PARK SCHOOL Intersection of Wildcat Canyon Road, Bear Creek Road and San Pablo Dam Road.	Wildcat Canyon Road and San Pablo Dam Rd	Orinda	CA	94563	Site of Historic Event	This school district was founded in 1882. The second school in Orinda was built on Wagner Ranch property, donated by General Theodore Wagner. The School was used until the Orinda High School District was formed and a new school built in 1925.
ORINDA AREA	WAGNER RANCH AND HOME Camino Pablo, Bear Creek Road and San Pablo Dam Road	Wildcat Canyon Road and Wagner Ranch	Orinda	CA	94563	Site of Historic Event/Site Relation to Important Person in History	Theodore Wagner, Surveyor-General, built a large home here on 241 acres of land in 1882. The Oak View Ranch was self-sustaining with elaborate orchards, olive trees, vineyards, a vinegar house, dairy, brick kiln, gas house, horse barn, carriage house, fish pond, blacksmith's shop and a servant's house. Old home site now maintained as historical study and nature area by East Bay Municipal Utility District.
ORINDA AREA	ORINDA PARK HOTEL Northeast corner of Bear Creek Road and San Pablo Dam Road	Bear Creek Rd and San Pablo Dam Rd	Orinda	CA	94563	Site of Historic Event/Site Relation to Important Person in History	Built by Theodore Wagner in 1885 in anticipation of the success of the California and Nevada Railroad. Used by the community until 1913. Part of the stone foundation is still visible.
ORINDA AREA	MINER RANCH Sleepy Hollow and Miner Road Area Incorporated	On Google Maps: "Sleepy Hollow"	Orinda	CA	94563	Site relating to Important Person in History	Many oil wells were drilled from 1888 through 1903 in the Miner Road area of Orinda. Several wells were drilled on Miner Ranch. Some of the wells at Miner Ranch yielded oil, although the actual quantities were small.
ORINDA AREA	THREE RANCHOS BOUNDARY Summit of Miner Road	596 Dalewood Dr	Orinda	CA	94563	Site of Historic Event	Common boundary of Ranchos Acalanes El Sobrante and Boca de la Canada del Pinole. Has been marked with a monument and memorial stone by the Orinda Historical Society.
ORINDA AREA	CONKLIN HOTEL Near Freeway at Crossroads					Site of Historic Event	Built in 1858 by James Conklin. Hotel was a principal landmark sited in many deeds of the 1880's.
ORINDA AREA	SULLIVAN RANCH AND HOME 607 El Toyonal Incorporated	607 El Toyonal	Orinda	CA	94563	Structure of Historical Significance	In 1879 Eugene Sullivan settled on 250 acres in Orinda. Ranch's dairy, the Orinda Creamery, served local residents between 1932-1938. Property remained an operating ranch until the 1960s.
ORINDA AREA	MISS GRAHAM'S RIDING ACADEMY 63 Orinda Way Incorporated	63 Orinda Way	Orinda	CA	94563	Structure of Historical Significance	Resort once famous throughout the Bay Area. People came to take lessons and ride horseback over the Orinda Trails. Only one quarter of the building remains as the Orinda Garage today.

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ORINDA AREA	DE LAVEAGA HOME 12 Bien Venida Road Incorporated	12 Bien Venida Rd	Orinda	CA	94563	Structure of Historical Significance/*Architectural** Specimen	Bien Venida was first built in 1888 by Miguel and Maria de Breton de Laveaga. The house was destroyed by fire in 1915 and a duplicate home was built from original plans on the same site. It has been continuously occupied by the de Laveaga family. E.I. de Laveaga, a son, later developed more than 1,100 acres of what is now Orinda. The two-story wood frame structure with truncated roof, gabled entrance, plus hip style, forms an irregular roof line. A windows walk, wood cresting and ornaments decorate the roof trim. First story walls are shiplap with patterned wood shingle at the second story. Shelf with boxed cornice and brackets between floor levels adds to the wall design along with an open veranda.
ORINDA AREA	FIRST ORINDA FIRE HOUSE Orinda Way Incorporated	33 Orinda Way	Orinda	CA	94563	Structure of Historical Significance/*Architectural** Specimen	Built in 1923 by Orinda Volunteer Fire Department and E.I. Laveaga as part of planned Orinda town site. Use until 1942 as a fire house and library. It is now a commercial building. Structure is a cross of early western style with false front and Spanish styling.
ORINDA AREA	ORINDA COUNTRY CLUB 315 Camino Sobrante Incorporated	215 Camino Sobrante	Orinda	CA	94563	Structure of Historical Significance/*Architectural** Specimen	Country Club built in 1924 by E.I. de Laveaga. Project included golf course and early subdivision.
ORINDA AREA	CASA VERANA 112 Camino Pablo Incorporated	112 Camino Pablo	Orinda	CA	94563	Structure of Historical Significance	Built in 1921 as the first store and gas station in Orinda. Purchased by E.I. de Laveaga and used for various community purposes. It is now used by commercial establishments.
ORINDA AREA	ORINDA STORE Orinda Village	37 Orinda Way	Orinda	CA	94563	Structure of Historical Significance	Built in 1924 by E.I. de Laveaga as part of planned town site along with firehouse, garage, and riding academy. Structure in continuous use ever since as a store.
ORINDA AREA	ORINDA FILTER PLANT 200 Block of Camino Pablo Incorporated	209 Camino Pablo	Orinda	CA	94563	Structure of Historical Significance	Present structure built in 1936. It is the largest filter plant in the east Bay Municipal Utility District (EBMUD) system, and serves most Berkeley and Oakland.
ORINDA AREA	OLD TUNNEL Old Tunnel Road	601 Fish Ranch Rd	Orinda	CA	94563	Site of Historical Event	Constructed in 1903 as a cooperative effort of Contra Costa and Alameda Counties. Were 1,100 feet long and 320 feed lower than the top of summit road. Used until 1937 when replaced by the low level “Caldecott Tunnel.” Portals can still be seen but are boarded up.
ORINDA AREA	ORINDA UNION SCHOOL 26 Orinda Way Incorporated	26 Orinda Way	Orinda	CA	94563	Structure of Historical Significance	Built in 1925 for Orinda Union School District, created by merger of Moraga School District and Orinda Park School District. Used as a school until 1973 when converted to Orinda Community Center.
ORINDA AREA	CALIFORNIA-NEVADA RAILROAD Kennedy Grove, El Sobrante Unincorporated/Incorporated	6531 San Pablo Dam Rd	El Sobrante	CA	94803	Site of Historic Event	In 1886 railroad stops of the California Nevada Railroad were scheduled at Frenchman’s Curve, along the present Hillside Drive. The area is now part of Kennedy Grove Regional Recreation Area which is maintained by the East Bay Regional Park District. California Point of Historical Interest CCo-4.

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ORINDA AREA	ORINDA THEATER Incorporated	3308, 4 Orinda Theatre Square	Orinda	CA	94563	Structure of Historical Significance/Site Relating to Important Person in History	Completed in 1945, this was Orinda's first theater and the last, large old theater of its type in Contra Costa County. It was designed by Alexander Aimwell Cantin (circa 1875-1964), one of California's first registered architects. The building is an example of streamlined modern styling. It contains murals on the foyer ceiling and auditorium walls painted by Anthony B. Heinsbergen (1895-1981) who decorated 747 movie theaters during his nearly 60 year career, including some of the best known Hollywood theaters. The theater is a major visual landmark in the community of Orinda. It was one of the first buildings built at the "Crossroads" and helped to establish a focal point for the developing suburban community. The theater and surrounding shops located at "the Crossroads" have been closed since 1980. The owner is currently in the process of redeveloping the corner, including the theater. It is projected to reopen by the end of 1989.
PACHECO AREA	PACHECO INN Pacheco Blvd. and Center Avenue	5867 Pacheco Blvd	Pacheco	CA	94533	Structure of Historic Significance	Structure built in the 1800s and still standing although remodeled. The inn was a stop for the stage coach on its route to and from Martinez.
PACHECO AREA	TOWN OF PACHECO	The whole town. 195 Brown Dr.	Pacheco	CA	94533	Site of Historic Event	Pacheco was established in 1860 by Dr. J.H. Carouthers who, with two others, purchased a sit on the bank of Walnut Creek and laid out a townsite. It was one of the important shipping centers in Contra Costa County in that era.
PACHECO AREA	PACHECO FLOUR MILL 105 Aspen Street Pacheco	105 Aspen Drive	Pacheco	CA	94533	Site of Historic Event/Site Relating to Important Person in History	The mill was built by W.K. Hendricks on land from George Loucks in 1857. The mill burned down in August in 1867 and was rebuilt in 1868 and was rebuilt in 1868 with help from local citizens. The vacant flour mill was totally destroyed by fire in 1913.
PACHECO AREA	GEORGE P. LOUCKS HOME Corner of Highway 4 and Old Pacheco Road, Pacheco	5039 Blum Rd	Martinez	CA	94553	Site Relating to Important Person in History	A two-story frame house with fluted eaves and covered front porch with balcony. The first residence built in Pacheco in 1853 by Garry L. Walwrath, from timbers hewn in Moraga Redwood. Sold to Loucks in 1857. Birthplace of Anne Loucks, the first child born in Pacheco and the town's grammar school teach for thirty-four years.
PACHECO AREA	LOUCK'S LANDING North of Highway 4 on Old Pacheco Road, Pacheco	5036 Blum Rd	Martinez	CA	94553	Site of Historic Event/Site Relating to Important Person in History	In the late 1850s this was a navigable slough and a turning basin for vessels of light draft. It was the mouth of Walnut Creek. George P. Loucks built a warehouse here to serve the small stern wheelers that came up the slough. Many years later the channel of Walnut Creek was changed to border Buchanan Field, the County airport.
PACHECO AREA	OAK PARK HOUSE 2089 Oak Park Blvd.	2097 Oak Park Blvd	Pleasant Hill	CA	94523	Structure of Historic significance	Single story frame cottage with elevated foundation and front glass porch. Built in the 1920's, structure is on land which was once a portion of the Elijah Hook Ranch. The house was purchased by the Oak Park Assembly of God in 1968. It now stands between the church and Pleasant Hill Elementary School.
PINOLE AREA	PINOLE WATERFRONT Foot of Tennent Avenue	11 Tennent Ave	Pinole	CA	94564	Site of Historic Event	This historical waterfront deserves recognition because of its importance as the nucleus of a shipping harbor, which marked the beginning of Pinole.

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PINOLE AREA	ELLERHORST HOME, Hercules	124 Buckley	Hercules	CA	94547	Structure of Historic Significance	Built during the 1860's after the Ignacio Martinez land was divided among his eleven children. In mid – 1870's Mr. and Mrs. C.H. Ellerhorst purchased and remodeled the cottage which still stands. The Ellerhorst's were quite active in the activities of Pinole.
PINOLE AREA	DOWNER HOME, San Pablo Avenue	2711 San Pablo Ave	Pinole	CA	94564	Structure of Historic Significance/ *Architectural** Specimen	Built in 1905 by Edward Downer, Sr. who established the first bank of Pinole, which opened for business October 25, 1905. Mr. Downer went on to establish a chain of banks in West Contra Costa County. He was Pinole's first city clerk (incorporation 1903) and held the post of mayor of the city of Pinole for nearly thirty years. The structure is a large mansion with fluted column porch supports.
PINOLE AREA	MARTINEZ ADOBES, Pinole Creek	4202 Alhambra Ave	Martinez	CA	94533	Site relating to important person in history	Site of the original homestead adobes built in the 1830's by the family of Don Ignacio Martinez. Headquarters of Pinole Grant, former alcalde and commandant. He planted the first wheat in the county.
PINOLE AREA	FERNANDEZ MANSION 100 Tennent Avenue Incorporated	100 Tennent Ave	Pinole	CA	94564	Structure of Historic Significance/ *Architectural** Specimen	The Fernandez Mansion—an example of 16th century classic manneristic architecture—is a stately twenty-two room redwood home located at the bay front of Pinole. It was built in 1849 by Bernardo Fernandez, a shipping merchant, who added to the growth of Pinole and West Contra Costa County by transporting its products across the bay. The mansion is listed in the National Register of Historic Places and is California Point of Historical Interest CCo-6.
PITTSBURG AREA	CAMP STONEMAN Railroad Avenue	2820 Harbor St	Pittsburg	CA	94565	Site of Historic Event	Camp Stoneman, named for General George Stoneman, a Civil War leader and the 15th Governor of California, encompassed 1,000 acres of land and was built in 1942 as an "embarkation" facility or "staging" area for World War II troops leaving for the Pacific theater. Also used during the Korean conflict in a like manner. Two million soldiers were processed through this site. Camp Stoneman was inactivated August 13, 1954.
PITTSBURG AREA	EARLY CALIFORNIA RAILROAD Pittsburg-Antioch Highway					Site of Historic Event	The Pittsburg mines and Black Diamond mines used standard gauge railroad track three years before the "Golden Spike" was driven at Promontory Point, Utah. The railroad transported coal from the mines to the San Joaquin River for shipment.
PITTSBURG AREA	ROSE HILL CEMETERY Somersville Mines Area Regional Park	On Google Maps: "Rose Hill Cemetery Nortonville Rd"	Pittsburg	CA	94565	Site of Historic Event	A burial ground three miles south of Pittsburg located in the Coal Mines Regional Park is the resting place of many Welsh Miners and their families. Ninety-two memorial headstones, inscribed in the Gaelic language of the ancient Celt record the past.
PITTSBURG AREA	MINE SHAFTS NORTONVILLE/SOMERSVILLE Cole Mines Regional Park	5175 Somersville Rd	Antioch	CA	94509	Site of Historic Event	Coal, known as the Black Diamond, was discovered in the foothills of north-eastern Contra Costa County in 1850. Noah Norton built the first home in the mine area in 1861—later knows as Nortonville. The mining families were mostly from England and Wales. This was the first fossil fuel source in California.
PITTSBURG AREA	COULTER PINE Black Diamond Way	5175 Somersville Rd	Antioch	CA	94509	Site of Historical Significance	The most distinctive single botanical species in the coal mines area is the Coulter Pine. Here it reaches its northernmost limit. This pine is characterized by large cones.

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PITTSBURG AREA	SOUTHERN PACIFIC RAILROAD DEPOT 1291 Railroad Avenue	1291 Railroad Ave	Pittsburg	CA	94565	Structure of Historical Significance/*Architectural** Specimen	An early railroad facility that added to the industrial development of Pittsburg, circa 1878. This two-story frame structure with a varied wall design of shiplap, vertical board and batten, fish scale shingles and decorated brackets incommoded passengers and cargo.
PITTSBURG AREA	SANTA FE RAILROAD DEPOT Black Diamond Street	1 W Santa Fe Ave	Pittsburg	CA	94565	Structure of Historical Significance	Transportation needs were changing to the faster railroad facilities for inland travel and depots were built to handle the passengers and cargo, circa 1900.
PITTSBURG AREA	SACRAMENTO-NORTHERN RAILROAD DEPOT	50 E 8th St	Pittsburg	CA	94565	Structure of Historical Significance	This railroad line, California's first electric line, inaugurated 1909, provided transportation between the Bay Area and the central valley communities including Sacramento, Woodland, Oroville, Chico, Marysville and Stockton.
PITTSBURG AREA	THEATER SITES York Street	351 Railroad Ave	Pittsburg	CA	94565	Site of Historic Event	The Black Diamond Theater built in 1909 and the Palace Theater built in 1910. The Enea Brother's theaters provided the first movies in Contra Costa County.
PITTSBURG AREA	VINCENT A. DAVI LIBRARY 80 Power Avenue	80 Power Ave	Pittsburg	CA	94565	Structure of Historical Significance	Pittsburg's library system began circa 1913. It was housed over the town's firehouse on 5th Street and Railroad Avenue. The new Vincent A. Davi Library named in honor of the late mayor of Pittsburg, opened April 24, 1966, at its present location on Power Avenue.
PITTSBURG AREA	FAGES-CRESPIE TURNBACK CAMP Buchanan Park, Buchanan Road	4150 Harbor St	Pittsburg	CA	94565	Site of Historic Event/Site Relating to Important Persons in History	The Fages-Crespie Expedition in 1772 was a final attempt to establish an inland land route to reach Point Reyes where the Mission of San Francisco was to be founded. The diary of the journey became the first written record of Eastern Contra Costa County. This site, recorded as "Turnback Camp," was the point at which the expedition abandoned their search for a crossing and turned southward to return to their base camp at Royal Presidio of Monte Rey (now Monterey).
PITTSBURG AREA	OAK SPRINGS COMMUNITY Buchanan Park , Buchanan Road	4150 Harbor St	Pittsburg	CA	94565	Site Relating to Important Person in History	James Kirker, an early American Frontiersman, headquartered at this site three miles south of New York of the Pacific (now Pittsburg) and established a community known as Oak Springs, California.
PITTSBURG AREA	PITTSBURG HISTORICAL DISTRICT Foot of Railroad Avenue, at Waterfront	District. 2099 Railroad Ave.	Pittsburg	CA	94565	Site of Historic Event/Site Relating to Important Persons in History	The waterfront area at Railroad Avenue has been considered as a district to provide a record of the historical past associated with fishing, shipping, the railroads and the people who contributed to the development of Pittsburg. A listing of the historical events associated with this area includes: (1) Rancho Los Medanos—A Land Grant awarded by Governor Don Bautista Alvarado in 1835 to Jose Mesa and Jose Garcia. (2) Colonel Jonathan Stevenson— Founder of New York of the Pacific (now Pittsburg). (3) General Williams Tecumsah Sherman—Surveyor of the town of New York of the Pacific. (4) First Post Office in Contra Costa County—In 1849 John Beemer was Postmaster of this office, then, located at Second and Black Diamond Street. (5) Booth Cannery—Site of early fishing center and cannery. Early cannery technology developed here. (6) Coaling Station—First steamboat stop between San Francisco and Sacramento where boats took on coal. (7) Cornwall Mansion—Home of P.B. Cornwall, Superintendent

Area	Resource/Location	Street No./Street Name	City	State	Zip Code	Evaluation Category	Significance/Importance
							of Black Diamond Coal Mines. The mansion located at the foot of Railroad Avenue, dates to 1861 and contained the local dispatcher and telegraph office. It was used as a residence until 1957. (8) Robert Reddeford Walker—Discoverer of the Pacific Tidewaters along the San Joaquin River route in 1833. He was the first American to follow the San Joaquin River to its mouth at Pittsburg. (9) Confluence of Sacramento and San Joaquin Rivers. (10) Cornwall Station-Built in 1878 (11) Steel Mill-Established in 1911 (12) Official Road-Railroad Avenue, an original road from the Cumberland Mines to the Town of New York of the Pacific 1849, followed by New York Landing 1850s, City of Pittsburg.
PITTSBURG AREA	CONGREGATIONAL CHURCH, West 4th and Montezuma Streets	425 W 4th St	Pittsburg	CA	94565	Structure of Historic Significance	The Congregational Church was first built in Nortonville for the mining community in 1882. It was moved to Pittsburg in 1884 and is still in use as a church.
PITTSBURG AREA	LATIMER RANCH Nortonville Road	5755 Nortonville Rd	Pittsburg	CA	94565	Structure of Historic Significance	The home of Leo Latimer, private owner of original patent by Governor Bigler of California. Home was built in 1850.
PITTSBURG AREA	LOS MEDANOS HOTEL	835 Railroad Ave	Pittsburg	CA	94565	Architectural* Specimen	A U-shaped two story stucco structure with decorated wood columns around windows, doors and corners. Balconies are located under windows at the second floor. A molded arch trim of wood surrounds the top structural opening of the windows on the first floor. Main entrance is recessed within an arcade. Built in 1917.
PITTSBURG AREA	BLACK DIAMOND DISTRICT OLD GRAMMAR SCHOOL West 8th and Black Diamond Streets	50 E 8th St	Pittsburg	CA	94565	Structure of Historic Significance	This grammar school was built in 1914 for the Black Diamond School District. It also housed high school classes when Pittsburg withdrew from the East County's Riverview Union High School District in 1923.
PITTSBURG AREA	PITTSBURG SEVENTH DAY ADVENTIST CHURCH East 9th and Los Medanos Streets	900 Los Medanos St	Pittsburg	CA	94565	Structure of Historic Significance/ *Architectural** Specimen	The history of this old Congregational Church is closely interwoven with the city's progress. It was dedicated September 28, 1919 and its red brick grandeur with a crenelated tower, decorated rose windows; stained glass windows and arched main entrance is a unique example of turn of the century architecture and style.
PITTSBURG AREA	CALIFORNIA THEATER Railroad and Central Avenues	351 Railroad Ave	Pittsburg	CA	94565	Structure of Historical Significance/*Architectural** Specimen	The California Theater is the majestic symbol of the city's past. The theater provided vaudeville and film entertainment from the era of silent movies to sound and color productions. This architectural structure with red and black tile and traditional theater marquee at the entrance has been proclaimed as a most magnificent theater. Built circa 1925.
PITTSBURG AREA	MILITARY CHAPEL STONEMAN PARK Harbor Street and Leland Road	390 E Leland Rd	Pittsburg	CA	94565	Structure of Historical Significance/*Architectural** Specimen	Two military chapels, built in 1942 at Camp Stoneman, are still in use by local congregations, This chapel displays the traditional architectural design associated with military bases built during World War II.
PITTSBURG AREA	ST. PETER MARTYR CHURCH West 8th and Black Diamond Street	740 Black Diamond St	Pittsburg	CA	94565	*Architectural** Specimen	A two-story high stucco structure with a tiled roof and a belfry tower located at the left of the main entrance. The tower has a narrow semi-circular opening at the top. The main entrance has a molded arch trim over the doorway and a rose window directly above with decorative panels on both sides. Main windows have a semi-circular top and are of stained glass. Built in 1925.

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PITTSBURG AREA	DOW CHEMICAL COMPANY Loveridge Road	901 Loveridge Rd	Pittsburg	CA	94565	Structure of Historical Significance	Production began July 1, 1916 at the Dow Chemical Company's Pittsburg plant. Owned then by the Great Western Electro-Chemical Company, the Pittsburg plant has grown to become the largest chemical production complex in the Western United States. The plant, which now occupies 450 acres of land and a mile of frontage along the San Joaquin River, was formerly a part of the old Rancho Los Medanos.
PITTSBURG AREA	JOHNS MANVILLE CORPORATION East 3rd and Harbor Street	598 E 3rd St. B	Pittsburg	CA	94565	Structure of Historical Significance	The Pittsburg plant of Johns Manville Product Corporation broke ground in 1923 and began production in 1926. The plant occupies a 25-acre site and produces a wide variety of home and industrial products.
PLEASANT HILL AREA	HOOK RESIDENCE 60 Hookston Road and Buskirk Avenue	60 Hookston Rd	Pleasant Hill	CA	94523	Structure of Historical Significance	William hook was a pioneer merchant in 18533 and owned a store in Pacheco. His son, Vincent, became a County Supervisor. A new home was built on the same site by Vincent's daughter. The Hooks owned about 2,000 acres of land in the area. This house was moved to Martinez when Hookston Square (an office complex) was built.
PLEASANT HILL AREA	THE DAILEY BARN AND COTTAGE, 301 Cortsen A Avenue	301 Cortsen Ave	Pleasant Hill	CA	94523	*Architectural** Specimen	A two story wood frame structure with a high gable roof and shiplap siding. An open veranda extends the front of the structure at the first story. Built in 1858, the barn is two stories high in the center section with a one story shed attachment on either side.
PLEASANT HILL AREA	THE ROGERS HOUSE, 315 Twinview Drive	315 Twinview Dr	Pleasant Hill	CA	94523	*Architectural** Specimen/Structure of Historic Significance	Circa 1867, this single story wood frame structure was built on a knoll with a view eastward overlooking the valley toward Mt. Diablo and Suisun Bay. Although additional rooms have been added to the original structure, the shiplap siding has been matched to retain the original appearance. A nearby park has been named in honor of Mr. Rogers.
PLEASANT HILL AREA	THE HENRY VESSING HOUSE 2979 Vessing Road	2979 Vessing Rd	Pleasant Hill	CA	94523	Structure of Historical Significance/*Architectural** Specimen	Adjacent to Murderer's Creek, Gambrel roof, stucco with dormers, large side Specimen porch, arch entry, built circa 1910. Tank house and windmill moved to property. Privately owned.
PLEASANT HILL AREA	THE BERWICK-VESSING HOUSE 3025 Vessing Road	3025 Vessing Rd	Pleasant Hill	CA	94523	Structure of Historical Significance	Colonial Revival style, wood siding with dormers and porch, two gabled roofs. Original section was a school moved from Pleasant Hill Road and Oak Park Blvd.
PLEASANT HILL AREA	THE BUTTNER HOUSE Off Grayson Road Near Taylor Blvd.	2590 Pleasant Hill Rd	Pleasant Hill	CA	94523	Structure of Historical Significance	TO BE DOCUMENTED
PLEASANT HILL AREA	THE BRANDON HOUSE Boyd Road near Brandon	481 Boyd Rd	Pleasant Hill	CA	94523	Structure of Historical Significance	Shingle wood structure, two stories, hip roof, old fireplace in central back, Berkeley style, built circa 1921. Privately owned.
PLEASANT HILL AREA	HANGMAN'S TREE 1985 Pleasant Hill Road, adjacent to Murderer's Creek	1985 Pleasant Hill Rd	Pleasant Hill	CA	94523	Site of Historic Event	Legend has it that an Indian was hung from this tree for horse stealing in the 1800s. This oak is estimated to be 200 year old.
PLEASANT HILL AREA	MURDERER'S CREEK Flows behind P. H. Elementary school, under Oak Park Blvd.	2097 Oak Park Blvd	Pleasant Hill	CA	94523	Site of Historic Event	This creek with three branches, North, Central and South, is indicated on the first Surveyor General's Map of Rancho Las Juntas area in 1864. A semi-developed path exists between the end of the school playground and Oak Park Lane.
PLEASANT HILL AREA	THE GEARY HOUSE Northwest Corner Pleasant Hill and Geary Roads	23 Limewood Pl	Pleasant Hill	CA	94523	Site of Historic Significance	Circa 1878, Lawrence Geary purchased a ranch of 400 acres to engage in farming. A two story redwood frame structure with overlap siding and medium gable roof was built on the farm. It was demolished in 1977 and redeveloped with new houses.

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PLEASANT HILL AREA	THE BAKER HOUSE 2485 Pleasant Hill Road	2485 Pleasant Hill Rd	Pleasant Hill	CA	94523	*Architectural** Specimen	A one-story wood frame cottage style structure with shiplap siding exposed rafters and a medium hip roof. Windows are two sash, double hung, with plain molding for surrounding detail. An open veranda extends across the front. A detached accessory building of the same styling is located at the rear of the cottage.
PLEASANT HILL AREA	FRANCISCO HOUSE 2937 Dorothy Drive	2937 Dorothy Dr	Pleasant Hill	CA	94523	*Architectural** Specimen	A one-story wood frame cottage-style structure with a medium gable roof and exposed rafters. Windows are two sash, doubled hung with plain molding for surrounding detail. Main floor is elevated over a ground level basement.
PLEASANT HILL AREA	WINDMILLS OF PLEASANT HILL	2391 Pleasant Hill Rd	Pleasant Hill	CA	94523	*Architectural** Specimen	It is said that windmills were quite numerous in Pleasant Hill and one still stands close to Pleasant Hill Road near Grayson Road. This metal structure is about sixty feet high with four foot oblique vanes radiating from a horizontal shaft.
PLEASANT HILL AREA	TEIGLAND TEAK HOUSE Teigland Road					Site of Historic Event	TO BE DOCUMENTED
PLEASANT HILL AREA	SHERMAN FIELD Highway 680 and Monument Blvd.	2314 Monument Blvd	Pleasant Hill	CA	94523	Site of Historic Event	Dedicated May 11, 1941. Private airport. Land purchased by A.J. Sassons and P.J. McManamy. Used for seven months until civilians were not permitted to fly with in 100 miles of the coast during World War II. The private airport was then leased to Pan American Airways for instrument flight training school. After the war Sherman Field was returned to private use. It closed in 1950 because of its small size and larger nearby Buchanan Field.
PLEASANT HILL AREA	ROCHE BARN (Land and Barn) 1525 Roche Drive	1525 Roche Dr	Pleasant Hill	CA	94523	Structure of Historical Significance	Built in 1905, part of original David Roche Ranch. California style with central loft and side stables, dual pitch roof. Privately owned.
PLEASANT HILL AREA	THE SANKO FARM Sanko Road near Taylor Blvd. and Ruth Street	320 Civic Dr	Pleasant Hill	CA	94523	Site of Historic Significance	Circa1938 agriculture and horses. Home of the Sanko brothers, Earl and John. Demolished in 1985, became Pleasant Hill City and Pleasant Hill Recreation and Park District Corporation Yard.
PLEASANT HILL AREA	DE MARTINI HOUSE Coggins Drive	3200 Buskirk Ave	Pleasant Hill	CA	94523	Structure of Historic significance	Attractive physical appearance probably remodeled at least twice – last being about 1930. Wood exterior with stucco, English Tudor with shingled roof and Tudor chimneys, front porch, Gothic detailing – finials and pendants, large front gable, side gable with dormers, believed circa 1920.
PLEASANT HILL AREA	PLEASANT HILL GRAMMER SCHOOL 2050 Oak Park Blvd.	2050 Oak Park Blvd	Pleasant Hill	CA	94523	Structure of Historical Significance	Oldest public building in Pleasant Hill. Built in 1920, stucco, one story with basement. Became Pleasant Hill's first recreation center when the new Pleasant Hill Elementary School on Oak Park Blvd. Opened in 1953. In 1970 it became the offices of the Pleasant Hill Police Department. In June 1982 it was rededicated as the Pleasant Hill Historical and Cultural Center and serves a consortium of community organizations, a theater and museum.
PLEASANT HILL AREA	BOSS SLATER HOUSE 2485 Pleasant Hill Road	2485 Pleasant Hill Rd	Pleasant Hill	CA	94523	Structure of Historical Significance	Previous homes of two early families; single hip roof, front altered although rustic balcony around porch, wood exterior, age unknown. The house was moved prior to construction of Taylor Blvd.

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PLEASANT HILL AREA	THE PATRICK RODGERS BARN AND HOUSE 315 Cortsen Road	315 Cortsen Rd	Pleasant Hill	CA	94523	*Architectural** Specimens/ Structures of Historical Significance	Built between 1866-1868, home of Patrick and Mary Rodgers. Gable roof on two-story wood farmhouse, wide front and side porch, one-story addition about 1900, doors and windows exhibit detailing of Greek Revival. California-style barn with central gabled room around which is wrapped a three-sided shed. Presently owned by Pleasant Hill Recreation and Park District. Plans include historic preservation of the house and barn and developing a historic park. Application has been made to list these buildings on the National Register of Historic Places.
PLEASANT HILL AREA	ARCHAEOLOGICAL SITE Gregory lane, west of Contra Costa Blvd. at east end of Two Worlds, a business/residential development.	21 Gregory Lane	Pleasant Hill	CA	94523	Structure of Historical Significance	As reported in 1950 U.C. Archaeological Survey #9 Department of Anthropology, University of California, Berkeley. Eleven complete skeletons discovered in 1946 on Robert Enge Property, 21 Gregory Lane, During excavation of swimming pool. Determined to be 8,000 to 10,000 years old by Anthropologists. Skeletons are now in the archives at U.C. Berkeley.
PLEASANT HILL AREA	WORLD WAR I MONUMENT Boyd Road near Contra Costa Boulevard	2511 Contra Costa Blvd	Pleasant Hill	CA	94523	Structure of Historical Significance	Circa 1927. Constructed in Monument and Contra Costa Boulevard, later moved when 680 freeway was built. Dedicated to the 77 Contra Costa County service personnel (76 men and 1 woman) who lost lives in World War I.
PLEASANT HILL AREA	THEODORE HOOK HOUSE 6 Street Lawrence Court	6 Lawrence Ct	Pleasant Hill	CA	94523	Structure of Historical Significance	Circa 1910. One of three houses built by James Hook for his sons. He preferred to call them “cottages.” In good condition with wood exterior and redwood interior, two stories with dormer, small basement. Classified as mid-western architecture. Theodore was grandson of Wm. Hook. This “cottage” is owned and occupied by Charles and Betty Peissner.
RICHMOND AREA	U.S. WHALING STATION Pt. St. Pablo	Dock SW of 1900 Western Dr	Richmond	CA	94807	Structure of Historical Significance	This structure was used by a whaling company for extracting whale oil during the depression years. It was the last whaling station in the U.S. to be closed. The ramps for hauling the whales out of the water are still attached to the structure.
RICHMOND AREA	EAST BROTHER LIGHT STATION Island off Pt. St. Pablo in San Francisco Bay	1900 Stenmark Dr	Richmond	CA	94801	Structure of Historical Significance/*Architectural** Specimen	For ninety-four years the Coast Guard maintained this lighthouse 24 hours a day. Families lived on this island and the children rowed to the mainland to attend a one-room schoolhouse. In 1968 the light beams were automated, although the steam powered fog horn remains intact. The Light Station underwent extensive restoration in 1979 and is listed in the National Register of Historic Places. It is now open to the public as a Bed and Breakfast Inn operated by the East Brother Light Station, Inc., a non-profit corporation licensed by the U.S. Coast Guard.
RICHMOND AREA	WINEHAVEN BUILDINGS Point Molate	2036 Stenmark Dr	Richmond	CA	94801	Structure of Historical Significance/*Architectural** Specimen	Circa 1900, the California Win Association built the biggest winery in the United States. Thousands of gallons were bottled and shipped to France and other markets of the world. Prohibition ended the winery business and the structure was used to make fertilizer from sardines and later a whaling company extracted whale oil at this location during the depression era. Facilities now used by the U.S. Navy, Fuel Department. Structure is very large and made of brick with turrets along the parapet.

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RICHMOND AREA	SANTA FE RAILROAD DEPOT Garrard Blvd.	240 Garrard Blvd	Richmond	CA	94801	Structure of Historical Significance	In 1901 the Santa Fe Railroad built a large repair facility at MacDonald Avenue and Garrard Boulevard for handling repair work north of Fresno. Facility including reading room and game room for the employees. An Indian village was behind the repair shop as living quarters for the Indians brought there to work. In 1969 the facility became the Western Terminal of the Santa Fe Railroad.
RICHMOND AREA	RED ROCK ISLAND (MOLATE) In San Francisco Bay, south of San Rafael Bridge	Island. "Red Rock Island"		CA		Site of Historic Event	Red Rock Island, about an acre, was excavated for manganese to be used in road building and industry and use for ballast in ships. It is now privately owned and used primarily by fishermen. It is noted for the fact that it is the point where three counties join—San Francisco, Marin and Contra Costa.
RICHMOND AREA	POINT RICHMOND HISTORIC DISTRICT Washington Avenue and Park Place	District. 105 Park Pl.	Richmond	CA	94801	Structure of Historical Significance/Architectural* Specimen/Site Relating to Important person in history	First business section of Richmond settled in 1900. Many of the original structures are still in existence and the area hasn't changed dramatically over the years. Structures such as "the Baltic Bar," "the Hotel Mac" and the Fire Station have been or are in the process of restoration. Baltic Bar at 135 Park Place, one of the outstanding show places of the early 1900s, was a regular visiting spot of Jack London. Structure has been restored to its earlier state. Hotel Mac at the corner of Washington Avenue and Cottage Avenue was originally known as "The Colonial Hotel," where all the elite of the Standard Oil Company lived until the 1920s. It was noted for fine food and excellent bar. A 1970 fire destroyed the interior of the hotel. It had been restored to its former grandeur. Old Firehouse No. 1 and Jail at 145 Park Place was the first firehouse and jail at Point Richmond and still stands with its original brick façade. The structure is split level with two arched openings for doorways and arched windows with center keystone. Two of the earliest buildings remain. The first Band of Richmond built in 1902 at the corner of West Richmond and Washington Avenue. The bank was located here until the early 1920s when it became the location of the First Richmond Mercantile Trust Company. It is now a clothing store. The building at 31 Washington was built by James Shaw in 1901 for the Lang Drug Company and the Brown-Sugrue Bootery. It is now a delicatessen.
RICHMOND AREA	OLD BRICK WORKS Brickyard Cove	1223 Brickyard Cove Ln	Richmond	CA	94801	Structure of Historical Significance	One of six brick companies in and around Richmond. It was first known as the Los Angeles Brick Co., and later was called the Richmond Press Brick Company. It was the last to close, and two kilns remain which were preserved by the owners of the condominiums known as "Brickyard Landing." It provided the first paving bricks for the Bay bridges.
RICHMOND AREA	ELLIS LANDING Foot of 10th St.	Route	Richmond	CA	94802	Site of Historic Event	A trade route between Richmond, San Pablo Bay and San Francisco was established by Captain George Ellis with two schooners, circa 1869. This route operated until the Santa Fe Railroad, with its freight trains and ferry boats, replaced the existing trade route, circa 1901.

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RICHMOND AREA	CHINESE FISH CAMP South of Pt. Molate	37.995705° lat, -122.457° long	San Rafael	CA	94901	Site of Historic Event	Established in the 1880s by Chinese fisherman. One hundred individuals earned their living here by netting San Francisco Bay shrimp and selling them throughout the Bay area. They also dried them for shipping back to China.
RICHMOND AREA	CONDIDO GUITERREZ ADOBE Mouth of San Pablo Creek	1599 Brookside Dr	San Pablo	CA	94806	Site of Historic Event	Built in 1845, it had the first fireplace in Contra Costa County. After Mexican rule it became a jail.
RICHMOND AREA	GIANT POWDER WORKS Point Pinole	5551 Giant Hwy	Richmond	CA	94806	Site of Historic Event	Established in 1882 as the Safety Nitro Company. The company built a post office, saloon and a railroad depot. Later became the Giant Powder Works than Atlas Powder Words, circa 1930. Sold to Bethlehem Steel in 1965. Point Pinole is now part of the East Bay Regional Parks.
RICHMOND AREA	OLD LIBRARY BUILDING 4th and Nevin	400 Nevin Ave	Richmond	CA	94801	Structure of Historic Significance/*Architectural** Specimen	The Women's Improvement Club bought a lot at 4th and Nevin which was the center of town, obtained a grant from the Carnegie Foundation and built a library which opened in 1910 and served the community until 1949. The structure now houses the Richmond Museum. This single-story brick structure is elevated over a full basement and stairway leading up to the main floor. Entry is and most of the hill was dug out for housing named the Easter Hill Project.
RICHMOND AREA	MAPLE HALL 3rd and Ohio	101 S 3rd St	Richmond	CA	94804	Structure of Historic Significance	Prior to 1910, a recreational center for Sante Fe railroaders and only place in the area where dances could be held. Traveling vaudeville acts and other forms of entertainment brought in by Santa Fe performed here. Now an apartment building.
RICHMOND AREA	BROOKS ISLAND Richmond Inner Harbor	Island. "Brooks Island"	Richmond	CA	94804	Site of Historic Event	Brooks Island, named after its owner, stands about a half-mile off Richmond Inner Harbor. To the pioneers it was known as Sheep Island because several men raised and pastured sheep there. In 1968, new interest was found as excavations determined that 4000 years of history could be unearthed. It has now been bought by the East Bay Regional Park and all amateur digging has been stopped. It is planned to be a public recreation area.
RICHMOND AREA	NICHOLL PARK MacDonald Avenue 29th to 23rd Street	3230 Macdonald Ave	Richmond	CA	94804	Site Relating to Important Person in History	Nicholl Park named in memorial to John Nicholl, one of the very early settlers on the San Pablo Ranch, circa 1857.
RICHMOND AREA	EASTER HILL 25TH TO 29TH Street and Cutting Blvd.	700 S 26th St	Richmond	CA	94804	Site of Historic Event	Easter Hill, a knoll about 150 feet high, so named because of the churches erected a large cross and held Easter Services at the knoll. Also used for hay and crop raising and quarry operation. Later used as a park until World War II when the government and Henry Kaiser built four ship yards.
RICHMOND AREA	EAST SHORE PARK 900 S. 47th Street	900 S 47th St	Richmond	CA	94804	Site of Historical Event/Site Relating to Important person in History	In the late 1860s. Richard Stege, a much traveled businessman of hotel, grocery and bakery background, settled on six hundred acres and engaged in farming and the delivering of powder to the railroads from the works which were on his land. He bought twenty acres of San Pablo Rancho and built the most gorgeous park in the northern part of the state. Large trees and plants were planted. Three large frog ponds were built so Mr. Stage could supply the large restaurants and hotels in San Francisco.

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RICHMOND AREA	POINT ISABEL Isabel Street	2701 Isabel St	Richmond	CA	94804	Site of Historical Event/Site Relating to Important person in History	Don Victor Castro owned many acres of land and had the most beautiful adobe house in California. Point Isabel was named after his favorite daughter. The point was a shipping point for the Castro Crops. Previously a beautiful hill, the point was flattened and a large post office depot to serve the entire Bay Area and a park now occupy the site.
RICHMOND AREA	ALVARADO PARK (Grand Canyon) McBryde Avenue	5755 McBryde Ave	Richmond	CA	94805	Site Relating to Important Person in History	Circa 1927, the City Council purchased 41 acres of the Grand Canyon Park, formerly the Tewksbury Estate, for the city park and recreation area. The park, which adjoins the Wild Cay Canyon Park, was named after Don Juan B. Alvarado, former Mexican Governor of California.
RICHMOND AREA	EMERIC RANCH Between 26th and 29th Streets	2851 Salesian Ave	Richmond	CA	94806	Site Relating to Important Person in History	Henry Emeric bought hundreds of acres of the San Pablo Ranch before the turn of the 20th century and his ranch had beautiful gardens, large enough to maintain deer and peacocks, exotic plants and trees from all over the world. He had many friends in the theater and arts, and provided weekend entertainment for them at his ranch. Mrs. Emily Tewksbury and John Nicholl bought the land after Mr. Emeric's death. Land was sold for homesites and the Salesian Fathers bought the land where the home stood and built their church and school.
RICHMOND AREA	CITY HALL 26th and Nevin Streets	450 Civic Center Plaza	Richmond	CA	94804	Structure of Historic Significance	When the city was being formed, an old box car was used for meetings; after a charter was passed, the City Hall was located at Point Richmond. A realtor, George Wall, later built and rented at $100 a month a new City Hall at 21st and Maine. When John Nicholl, Jr. learned of the rental he presented a free gift of a City Hall at 26th and Nevin in 1916. Site is now the new Civic Center and City Hall.
RICHMOND AREA	CALIFORNIA CAP WORKS South 33rd and Hoffman Boulevard	710 S 33rd St	Richmond	CA	94804	Structure of Historic Significance	One of the several manufacturing plants in the area associated with explosives. Fuses and caps for guns, and army artillery were made here from about 1874 to 1946. After the factory closed down, the University of California bought the land and building for Marine Biology Research.
SAN PABLO AREA	ALVARADO ADOBE San Pablo Avenue & Church Lane	13831 San Pablo Ave	San Pablo	CA	94806	Site Relating to Important Person in History	The Alvarado Adobe was built in 1845 by Jesus Maria Castro. It became the home of California Governors Juan Bautista Alvarado and his wife, Martina Castro, from 1848 to 1882. It was reconstructed in 1978 and is now open as a museum featuring a Rancho-era bedroom and a Victorian-style parlor.
SAN PABLO AREA	BLUME HOUSE, ALVARADO SQUARE San Pablo Avenue near Church Lane	13831 San Pablo Ave	San Pablo	CA	94806	Structure of Historical significance	Built in 1905 and formerly Hilltop Drive, it was the headquarters for the sprawling Blume Ranch and the largest single-family dwelling within the community. Now located in Alvarado Square Complex, the house is a museum featuring turn-of-the-century furnishings.
SAN PABLO AREA	TEXIERA HOME, ALVARADO SQUARE San Pablo Avenue near Church Lane	13831 San Pablo Ave	San Pablo	CA	94806	Structure of Historical significance	The Texiera home was originally located at the corner of Van Ness and Standard Streets, and served as residence of one of San Pablo's leading families. Built in the early 1890s, the house will become a community facility at its new location in the Alvarado Square Historic Park Complex.

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SAN PABLO AREA	THE PULLMAN STREET RECTORY	1841 Pullman St	San Pablo	CA	94806	Structure of historical significance/*Architectural** Specimen	Formerly a rectory for St. Paul's Parish, this Italianate-style four bedroom structure, built in 1875, was relocated during the 1930s to Pullman Street. "The Old Rectory" was recently moved back from Pullman Street to Church Lane and is currently being used for commercial offices. Italianate style.
SAN PABLO AREA	ANDRATA HOUSE 918 Randy Lane	918 Randy Ln	San Pablo	CA	94806	Structure of Historical Significance	Built in the early 1900s by Andrata, a foreman of the Emeric Ranch, who was able to purchase a considerable amount of land from his employer who had to sell land to help pay the cost of legal fees. The litigation between the Emerics and the Castro family over the vast land holdings forced both families to sell property at a loss.
SAN PABLO AREA	MELLO RESIDENCE 14006 San Pablo Avenue	14006 San Pablo Ave	San Pablo	CA	94806	Structure of Historic Significance/*Architectural** Specimen	This center gable T-shaped wood frame structure with shiplap siding was built in 1875 by one of the first families to settle in the San Pablo area. The Mellos were Portuguese immigrants from the Azore Islands. Three generations of Mellos have been raised in this two bedroom home.
SAN PABLO AREA	STANLEY ALTER HOME 2022 Road 20	2022 Road 20	San Pablo	CA	94806	Structure of Historic Significance/*Architectural** Specimen	This structure was built by San Pablo's early Portuguese settlers. Constructed with square nails and two inch thick redwood planks, the house was originally built and owned by a man named Machado, an early day community leader. The Alter family bought the house in 1948.
SAN PABLO AREA	RUMRILL-HELMS HOUSE 190 Road 20	190 Road 20	San Pablo	CA	94806	Structure of Historic Significance/*Architectural** Specimen	This structure was built in 1884 by A. Rumrill, one of San Pablo/s turn-of-the-century construction contractors and an original member of the Board of Trustees for the Richmond Unified School District. Rumrill Boulevard was named in his honor. The house later became the home of Rumrill's daughter and husband, Walter W. Helms, noted as being the first Richmond School District Superintendent.
SAN PABLO AREA	EARTHQUAKE REFUGE 2650 Market Avenue	2650 Market Ave	San Pablo	CA	94806	Site of Historic Event/Site Relating to Important Person in History	Victims of the 1906 earth-quake and fire in San Francisco were given food, clothing, shelter, medical attention here in barrack-style buildings and hospital, sponsored by Standard Oil Company with John D. Rockefeller funds. A shed-like structure is all that remains of the camp.
SAN PABLO AREA	BOUQUET CHATEAU	5739 Mcbryde Ave	San Pablo	CA	94806	Architectural* Specimen	This ten-bedroom structure, built in 1911 by a man named Bouquet, is unique in its style and design as a chateau, with high gable roofs. It has had several uses including a night club and an orphanage. Presently it is being restored by the owner.
SAN PABLO AREA	ST. PAUL'S CATHOLIC CHURCH AND GRAVEYARD 1825 Church Lane	1825 Church Lane	San Pablo	CA	94806	Site of Historic Event/Site Relating to Important Person in History	California's Governor, Alvarado, and his wife, Martina Castro Alvarado, gave almost four acres of land to the community for a church site. San Pablo's earliest settlers built St. Paul's church in 1863. The original church was of frame construction and similar in design to Old World churches. It was located on Church Lane, just west of the present St. Paul's and cost $300 to build. The graveyard that was located just south of the church was moved to accommodate St; Paul's Elementary School
SAN PABLO AREA	TEWKSBURY HOME Between San Pablo Avenue and Willow Road	2930 Willow Rd	San Pablo	CA	94806	Site of Historic Event	Dr. Jacob Tewksbury acquired about 7,000 acres of land in San Pablo, which was earlier part of the Rancho San Pablo of Joaquin Castro. The Doctor's holdings included an island where Standard Oil Company now stands. He filled the tidelands to connect the island to Richmond.

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SAN PABLO AREA	DEPOT BUSINESS AREA 13th and Market Streets	1320 Market Ave	San Pablo	CA	94806	Site of Historic Event	Site of an early commercial area built around railroad depots. Included: Emeric Hall; Depot School; grocery store; Dolan Saloon; Fish & Blume Warehouse; Gould Landing; Dr. Goodale Home, Santa Fe and Southern Pacific Railroads.
SAN RAMON VALLEY AREA	FIRST GRAFTED WALNUT TREE Front of 18 Garden Estates Court, Alamo	18 Garden Estates Ct	Alamo	CA	94507	Site of Historic Event	Sit of first walnut tree grafted in San Ramon Valley by Myron W. Hall in 1872. Plaque has been dedicated.
SAN RAMON VALLEY AREA	FRANCISCO GARICA ADOBE Northeast corner of Stone Valley Road and Danville Boulevard, Alamo	3188 Danville Blvd	Alamo	CA	94507	Site of Historic Event	Site of a two-story adobe structure built in 1848 by Francisco Garcia on land purchased from the Romero Grant. Later purchased by John M. Jones and became site of first post office in Alamo in 1851. Home burned in 1893 when owned by John O. Reis. Property bought by August Humburg who built another large home on same site, circa 1923. Later became residence of his daughter, Mrs. Friederiche H. Jackson, who lived in it until sold in 1967 to Safeway Stores. Home sit was on a knoll, the leveling of which revealed an Indian burial ground, which dates back some 4,000 years. The San Ramon Valley Historical Society has placed a plaque to dedicate this site of the first post office in Alamo.
SAN RAMON VALLEY AREA	ALAMO SCHOOL Danville Boulevard and Stone Valley Road, Alamo	3191 Danville Blvd.	Alamo	CA	94507	Site of Historic Event	Circa 1867, Alamo's first public grammar school, was built and used until the 1960s. The third school built on this site was torn down and is now the site of a Savings and Loan institution.
SAN RAMON VALLEY AREA	HENRY'S HOTEL Danville Boulevard at Alamo Square, Alamo	1465 Danville Blvd	Alamo	CA	94507	Site of Historic Event	Built in 1854 by S. Wolf & Company, managed by Henry Hoffman, a partner. Originally, portion used also as general store, later a saloon. Structure was torn down in July 1954 and is now the site of a gas station.
SAN RAMON VALLEY AREA	ALAMO SHOOTOUT Danville Boulevard and Orchard Court, Alamo	3150 Danville Blvd	Alamo	CA	94507	Structure of Historical Event	Site where, August 25, 1861, James Smith, itinerant farm hand, stalked E. Van Deventer, resident of North Alamo. The range was virtually eyeball-to-eyeball, although Van Deventer crouched behind his horse. Both men fired one shot; only Smith was hit, not fatally.
SAN RAMON VALLEY AREA	UNION ACADEMY Danville Boulevard and El Portal, Alamo	10 Fairmaiden Ln	Danville	CA	94526	Structure of Historic Event	Area's first school (private) built in 1860 under auspices of Contra Costa Education Association. Reverend David McClure was first headmaster. Destroyed by fire in 1868. A wooden plaque designates this site area.
SAN RAMON VALLEY AREA	ALAMO CEMETERY El Portal Road and Lagonda Way, Alamo	912 El Portal	Danville	CA	94526	Site of Historic Event	Burial ground for many San Ramon Valley pioneers. The San Ramon Valley Historical Society has placed a plaque to dedicate this site.
SAN RAMON VALLEY AREA	JOSE MIGUEL GARCIA ADOBE Austin Lane, north of Stone Valley Road, Alamo	10 Austin Ln	Alamo	CA	94507	Site Relating to Important Person in History	Built in 1848, on land purchased by Romero Grant, this adobe later became the home of Albert W. Stone, an early pioneer farmer. Mr. Stone's property of 800 acres adjoined the town of Alamo.
SAN RAMON VALLEY AREA	ALONZO STONE HOME. Stone Valley Road opposite Gay Court, Alamo	3204 Stone Valley Rd	Alamo	CA	94507	Structure of Historic Event	Site of a pioneer home built in 1852, razed 1954. An old grape arbor, planted in the 1880s, still stands.

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SAN RAMON VALLEY AREA	WHITE GATE FARM Green Valley Road and Stone Valley Road, Alamo	3207 Stone Valley Rd	Alamo	CA	94507	Structure of Historical Significance/*Architectural** Specimen	Built in 1856 this structure is known today as "White Gate Farm." The home took on the architectural features of a New England design and was built with square hand-made nails. The foundation was originally made of redwood mud bricks. The pioneer home was built by the brothers Nathaniel and Charles Howard, whose original residences was in New England. The house was constructed of redwood logged in Redwood Canyon, sent all the way back to New England to be milled. White Gate stables and bunkhouses provided a necessary stop over for horses and drivers on one of first stagecoach lines that went through the White Gate Property to Clayton. The house, with alterations and remodeling, still stands. A historical plaque was placed at this site by the San Ramon Valley Historical Society.
SAN RAMON VALLEY AREA	MOUNTAIN HOUSE Mt. Diablo near Junction of North Gate and South Gate Road, Mt. Diablo	On Google Maps: "Junction Ranger Station"	Walnut Creek	CA	94598	Structure of Historic Event	The Mountain House was built and opened in 1874 by a Mr. Hall. Later owned by a Mrs. Margaret Sloan, the house was located two miles from the summit. The sixteen room, three point structure catered to visitors traveling to the summit of Mt. Diablo and was also the stage coach Hall, and temporary site for high school. Lillian Close opened a County branch library here in 1913.
SAN RAMON VALLEY AREA	MT.DIABLO STATE PARK, Mt. Diablo	On Google Maps: "Mt. Diablo State Park"	Walnut Creek	CA	94598	Site of Historic Event	In 1851, Colonel Leander Ransome established Mt. Diablo as base meridian for all Northern California. Established as a park in 1921. Archaeological studies indicate that on a shelf area immediately below summit, generations of Indians rendezvoused annually for intertribal festivities.
SAN RAMON VALLEY AREA	OAKWOOD STOCK FARM El Nido and Diablo Boulevard, Diablo	133 Merano St	Danville	CA	94526	Site of Historic Event	Established by the Central Pacific Railroad and first known as Railroad Ranch, later Oakwood Ranch. Daniel Cook inherited property and built several barns, race track, billiard hall and a reservoir. Renowned for its line of thoroughbred cattle and trotting horses in 1880 – 1894. The dairy building, once used as a post office and now abandoned, is the only remaining structure.
SAN RAMON VALLEY AREA	CHARLES GARDNER GOOLD HOME, Blackhawk Road, Diablo	3420 Camino Tassajara	Danville	CA	94506	Site of Historic Event	Built in 1870 by Goold who died in 1880. Believed to be one of the first homes built on what is now Blackhawk Ranch.
SAN RAMON VALLEY AREA	BLACKHAWK RANCH QUARRY, Blackhawk Road, Diablo	37° 50.972′ N, 121° 55.948′ W	Danville	CA	94506	Site of Historic Event	"TO BE DOCUMENTED"
SAN RAMON VALLEY AREA	MOUNTAIN VIEW HOTEL, Hartz Avenue and School Streets, Danville	100 School St	Danville	CA	94526	Site of Historic Event	J.H. Gernant and his wife, former operators of the Railroad house, opened this twelve room hotel on August 1, 1891, razed in the 1960's.
SAN RAMON VALLEY AREA	DANVILLE GRANGE, 233 Front Street, Danville	233 Front St	Danville	CA	94526	Structure of Historic Significance	Present location of the Village Theater, the lobby of which was the original Grange Building, built in 1873. Enlarged in 1912 to house the Independent Order of Odd Fellows.
SAN RAMON VALLEY AREA	ROBERT BALDWIN HOME, Camino Ramon in Danville Station Subdivision, Danville					Site Relating to Important Person in History	Site of home and farm of one of early settlers in San Ramon Valley (1852). His farm was one of the finest in the County and at one time consisted of 900 acres. His second home built in 1888, burned in the 1950's.

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SAN RAMON VALLEY AREA	FIRST BUILDING IN DANVILLE, Front Street and Diablo Road, Danville	155 Diablo Rd	Danville	CA	94526	Site of Historic Event	Site of first building in Danville, built by Daniel and Andrew Inmanin 1858 as a blacksmith shop. Later a grocery store which also housed the area's first telephone exchange, Odd Fellow's Hall, and a temporary site for high school. Lillian Close opened a County branch library here in 1913.
SAN RAMON VALLEY AREA	ROBERT LOVE HOME West end of Love Lane, Danville	488 Love Lane	Danville	CA	94526	Structure of Historical significance	Built in 1860. The Robert Love residence still stands. It has been remodeled with additions several times.
SAN RAMON VALLEY AREA	GOOLD-DEARDORFF HOME Boon Court and San Ramon Valley Blvd., Danville	611 San Ramon Valley Blvd	Danville	CA	94526	Site Relating to Important Person in History	Circa 1880, Charles Gardner Goold and wife, Allie Johnson, built their home at this site. Four redwood trees planted by Goold in 1913 mark the home site. Daughter Wanda and husband, Gerald Deardorff, were last residents. Razed in 1974. A plaque dedicated by San Ramon Historical Society is in place at the redwood trees.
SAN RAMON VALLEY AREA	DANVILLE PRESBYTERIAN CHURCH 201 Front Street, Danville Incorporated	201 Front St	Danville	CA	94526	Structure of historical significance	Organized in 1865 as Contra Costa Presbyterian church. Renamed Danville Presbyterian church and cornerstone laid October 1, 1875. On May 27, 1932, it burned down and a new church building was erected and used until 1951. It is now a school. The San Ramon Valley Historical Society has placed a plaque to dedicate the church site.
SAN RAMON VALLEY AREA	CAPTAIN PEDRO FAGES MONUMENT Danville Boulevard and El Portal, Danville	856 Danville Blvd	Danville	CA	94526	Site Relating to Important Person in History	California Historical Landmark #853 marks the vicinity of campsite of Don Pedro Fages and Father Juan Crespi who made the first exploration of county in 1772. Camp site date was March 31, 1772.
SAN RAMON VALLEY AREA	ALAMO CUMBERLAND PRESBYTERIAN CHURCH Danville Boulevard and El Portal Danville	902 Danville Blvd	Alamo	CA	94507	Site of Historic Event	Alamo Pioneers, John and Mary Jones, in 1851 called a camp meeting and helped organize the Alamo Cumberland Presbyterian Church. A newspaper "Pacific Cumberland Presbyter" was published briefly in the early 1860s.
SAN RAMON VALLEY AREA	DANVILLE GRAMMER SCHOOL 279 Front St., Danville Incorporated	279 Front St	Danville	CA	94526	Site of Historic Event	First school built in 1858; second school in 1865m, a one-classroom structure; third, a larger school established in 1890s closed before 1920 when classes opened in the new grammar school adjacent to the San Ramon Valley Union High School. This last grammar school building, which later was used as a community center, was torn down and the site now is a high school parking lot.
SAN RAMON VALLEY AREA	"TAO HOUSE" Eugene O'NEILL HOME Kuss Road, Danville	1000 Kuss Rd	Danville	CA	94526	Structure of Historical significance	Built in 1937 by the four-time recipient of Pulitzer Prizes and winner of the Nobel Prize for Literature, Eugene O'Neill, who did some of his finest work while living here at "Tao House." The L-shaped two story structure built out of adobe-like basalt blocks, with a black oriental-type tiled roof, has sixteen rooms and recessed areas for bookshelves to hold 8,000 books. Listed on National Register of Historic Places, in 1976 Tao House was designated a National Historic Site by Act of Congress, signed by President Ford.
SAN RAMON VALLEY AREA	SCHOOL HOUSE Tassajara, Finley Road, One-Half mile north of Camino Tassajara, Danville	1125 Finley Rd	San Ramon	CA	94583	Structure of Historical significance	A one-room school house with a bell tower built in 1888. Structure now used as a community center.

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SAN RAMON VALLEY AREA	LEVI MAXCY RANCH North of Camino Tassajara on Hansen Lane, Danville	4177 Camino Tassajara	Danville	CA	94506	Structure of Historical significance	Levi Maxcy settled here in the early 1850s. He leased the ranch in 1880 and lived in Illinois, returning here in 1888. He planted vines and sold grapes. He later replaced the vineyard with a walnut orchard. In 1890 he built the house that is still standing. Levi Maxcy died in 1913.
SAN RAMON VALLEY AREA	SAN RAMON GENERAL STORE San Ramón Valley Blvd. and Old Crow Road, San Ramon	2323 San Ramon Valley Blvd	San Ramon	CA	94583	Structure of Historic Event	A two-story clapboard structure dating back to 1880s served as a store, gas station and post office. Early owner was Henry Hurst who sold it to William C. Fereira in 1924. Upstairs was once used as a community dance hall, later was partitioned as living quarters. Building was razed by "controlled burn" on June 15, 1963.
SAN RAMON VALLEY AREA	SAN RAMON SCHOOL San Ramon Valley Blvd. and old Crow Road, San Ramon	2233 San Ramon Valley Blvd	San Ramon	CA	94583	Structure of Historic Event	Built in 1867 and believed to be the second school in the area. This all-wood structure had two rooms with thirteen food ceiling and bell tower. It was abandoned in 1950 and razed in 1960. Isabel Gans was the last teacher.
SAN RAMON VALLEY AREA	SYCAMORE SCHOOL Camino Tassajara four miles east of Danville					Structure of Historic Event	School opened in 1866 with 21 pupils in one room. Mary E. Hass was the teacher. Trustees were Isaac Russell, D. N. Sherbourne and Charles Wood, Sr. By June 1928, only 11 students were in attendance forcing the school to close and consolidate with Danville Union School District.
SAN RAMON VALLEY AREA	LEONARD EDDY CABIN 2900 Camino Tassajara, Danville	2900 Camino Tassajara	Danville	CA	94506	Structure of Historical significance	Leonard Eddy is locally reputed to be first settler in this area. He built a small wood cabin in 1851. The cabin has been kept as a farm building. Eddy sold the ranch in 1853 to Philip Mendenhall who in turn sold the ranch to the Wood family. The Eddy cabin is reported to be the oldest original structure still standing in San Ramon Valley.
SAN RAMON VALLEY AREA	PHILIP MENDENHALL HOME 2900 Camino Tassajara, Danville	2900 Camino Tassajara	Danville	CA	94506	Structure of Historical significance	Philip Mendenhall purchased the land and cabin of Leonard Eddy, and built a two-story wood fame house in 1853. The property was then sold to Wood family and became the birthplace of the late Charlotte Wood, a famous long-time teacher in the area. The residence is still owned by the Wood family.
SAN RAMON VALLEY AREA	TASSAJARA POST OFFICE East side of Finley Road Danville					Structure of Historic Event	A small, squarish board-and-batten farm utility building which became a post office on October 24, 1896, with George M. Cole as postmaster. In the late 1890s the office moved across the street to the home of Anton Peterson. Office closed October 31, 1922. Original structure removed.
SAN RAMON VALLEY AREA	JOEL HARLAN HOME 19251 San Ramon Valley Blvd. San Ramon Incorporated	19251 San Ramon Valley Blvd	San Ramon	CA	94583	Structure Relating to Important Person in History/*Architectural** Specimen	Joel Harlan, an early California pioneer (1846), settled in the San Ramon area in 1852. His first dwelling was a boundary marker, defining the line between Alameda and Contra Costa Counties. He dismantled the structure and rebuilt at the present site, naming it "El Nido" (The Nest). Structure is a two-story wood frame building with a high gable roof and additional gables as roof trim. Sawed barge boards add to decorative trim. Window structure detail has shaped lintel with triangular shelf above. The home is still occupied by members of the family.
SAN RAMON VALLEY AREA	DAVID GLASS HOME San Ramon Valley Blvd., San Ramon	19953 San Ramon Valley Blvd	San Ramon	CA	94583	Structure Relating to Important Person in History/*Architectural** Specimen	David Glass settled in Contra Costa County in 1850, bought 718 acres of land in 1858, and in 1859 built this substantial mansion, which still stands.

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SAN RAMON VALLEY AREA	CHRISTIAN WIEDEMANN RANCH Norris Canyon Rd., San Ramon	3686 Norris Canyon Rd	San Ramon	CA	94583	Structure of Historical Significance	Wiedemann, a ship's carpenter, settled here in the 1860s and built this two-story frame home. His son, Fred, expanded the ranch to 3,000 acres. The home is still occupied by members of the family.
SAN RAMON VALLEY AREA	REDWOOD TREE PLAQUE Front Street next to Lynn, Danville					Site of Historic Event	This redwood tree was planted in 1875 by the Reverend R. Symington, first pastor of the old original Presbyterian church.
SAN RAMON VALLEY AREA	SAN RAMON HALL West of San Ramon Valley Blvd. on Old Crow Canyon Rd., San Ramon	2333 San Ramon Valley Blvd	San Ramon	CA	94583	Site of Historic Event	A two-story wood frame structure built in the early 1900s by popular subscription as a community hall. Torn down in the early 1960s.
SAN RAMON VALLEY AREA	WILLIAM LYNCH HOME Crow Canon Rd. & Old Crow Canyon Rd. San Ramon	2770 Crow Canyon Rd	San Ramon	CA	94583	Site relating to important person in history	William Lynch was one of the first American settlers in the area, first known as Lynchville, then Limerick, then San Ramon. He was a farmer and area's first merchant. He built two homes in the area.
SAN RAMON VALLEY AREA	LYNCH-ALEXANDER HOUSE Crow Canyon Rd. & San Ramon Valley Blvd., San Ramon	2421 San Ramon Valley Blvd	San Ramon	CA	94583	Site relating to important person in history	Circa 1885m, Dr. Alexander built his home at this site. Dr. Alexander married Mary Lynch, daughter of William Lynch who was a pioneer settler in the area. Everett Thomas Lynch, born on the Lynch Ranch was the last occupant of this home before it was razed about 1968.
SAN RAMON VALLEY AREA	NORRIS HOME Norris Canyon Rd. ¼ mile west of San Ramon Valley Blvd., San Ramon	3755 Noris Canyon Rd	San Ramon	CA	94583	Site relating to important person in history	In 1850 Leo Norris bought 4,400 acres of land from Jose Maria Amador, extending southward from Old Crow Canyon Road to about present line of Interstate 580. His home was a two-story, thirteen room frame house of rustic redwood outside, "hard finished" inside. Built in 1850, burned down in the 1950s.
SAN RAMON VALLEY AREA	AUGUST HEMME HOUSE East side of Danville Blvd. near Deodar Lane, Alamo	50 Medlyn Ln	Alamo	CA	94507	Site of historic E\event	This large two-storied mansion was built in 1876 and burned after the turn of the century. It was the last San Ramon Valley home of the pioneer August Hemme who settled here in 1852 and whose farm became the finest in Contra Costa County in the 1870s.
SAN RAMON VALLEY AREA	DANVILLE HOTEL 101-155 S. Hartz Avenue, Danville	411 Hartz Ave	Danville	CA	94526	Structure of Historical Significance	The building was built in the early 1890s on Railroad Avenue, was turned around and moved across the lot to Hartz Avenue in the late, 1920s. It is now part of the Danville Hotel Territory Site which the San Ramon Valley Historical Society dedicated by placing a bronze plaque in 1977.
SAN RAMON VALLEY AREA	ALBERT JEFFERSON YOUNG HOUSE 911 San Ramon Valley Blvd., Danville	911 San Ramon Valley Blvd	Danville	CA	94526	Structure of Historical Significance	Built in the 1870s, now renovated and turned into medical offices, a plaque was placed on this house by the San Ramon Valley Historical Society in honor of A.J. Young, a prominent citizen who came to the San Ramon Valley in the middle 1860s, who taught school here from 1865-1900, was superintendent of Sunday school at the Presbyterian Church for over 50 years, served as trustee on the Board of Education of Contra Costa County and a term in the State Assembly.
SAN RAMON VALLEY AREA	NORRIS FAMILY CEMETARY On a hill just south of Norris Canyon Rd. And west of San Ramon Valley Blvd., southwest of St. Joan of Arc Church, San Ramon	2601 San Ramon Valley Blvd	San Ramon	CA	94583	Structure of Historical Event	Pioneer members of the Norris family are buried in this cemetery. The tombstones have long been removed and the graves are now unmarked.
SAN RAMON VALLEY AREA	FIRST SAN RAMON Was on the north side of Norris Canyon Rd. between Norris Cemetery and the Norris home near Twin Creeks Development, San Ramon	27717 San Ramon Valley Blvd	San Ramon	CA	94583	Structure of Historical Event	Site of the first school in San Ramon.

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SAN RAMON VALLEY AREA	JAIL Across from the San Ramon General Store on east side of the San Ramon Valley Boulevard	2270 San Ramon Valley Blvd	San Ramon	CA	94583	Structure of Historical Event	This small wood structure housed drunks, itinerants and perhaps a cattle rustler or two.
SAN RAMON VALLEY AREA	ABANDONED SOUTHERN PACIFIC RAILROAD RIGHT-OF-WAY Comprised of the 19.5-mile portion within Contra Costa County					Structure of Historical Event	Almost all of this right-of-way was conveyed free to the Southern Pacific Railroad Company in 1890 by hardworking citizen committees who had secured the land through donations and local subscription. Rail service began in June 1891, for both passenger and freight which mainly was to carry agricultural products to markets. While passenger service ended much earlier, the freight service ran until 1978. Contra Costa County has or is in the process of purchasing all of the right-of-way. In 1985 Contra Costa County entered into an agreement with East Bay Regional Park District to allow recreational trail use along the right-of-way. It has been named the San Ramon Valley Iron Horse Trail. A three-mile section from W. Stone Valley Road, Alamo, to Prospect Ave., Danville, has been completed and is open for public use.
WALNUT CREEK AREA	BANCROFT RESIDENCE 1500 Bancroft Road	1500 Bancroft Rd	Walnut Creek	CA	94598	Structure of Historical Significance	One of the early ranch sites in Ygnacio Valley. Original structure replaced by present home in 1922. Still houses members of the Bancroft family who have contributed to the area's history. The present two-story brick structure with a sheathing of stucco is a large imposing residence with a formal garden and green houses.
WALNUT CREEK AREA	BRUBAKER RESIDENCE 30 Brubaker Lane	30 Brubaker Dr	Walnut Creek	CA	94596	Structure of Historical Significance	In November 1974, the "Walnut Creek Action for Beauty Council" designated Mrs. John Brubaker's Valley Oak tree as a "Heritage Tree" for its outstanding contribution to scenic beauty.
WALNUT CREEK AREA	BURGESS RESIDENCE 2950 Walnut Blvd.	2950 Walnut Blvd	Walnut Creek	CA	94596	Structure of Historical Significance	Formerly the James P. Howe estate. He was a foreign correspondent during World War I. Property is now being preserved as open space.
WALNUT CREEK AREA	CASEY RESIDENCE 2651 Oak Grove Road	2651 Oak Grove Rd	Walnut Creek	CA	94598	*Architectural** Specimen	A cottage-style home that is typical of the construction of the period, circa 1910.
WALNUT CREEK AREA	HOWARD RESIDENCE 2372 Walnut Blvd.	2372 Walnut Blvd.	Walnut Creek	CA	94597	Structure of Historical Significance	Several homes are located at this site housing members of the Howard family, founders of the Howard Terminal shipping point.
WALNUT CREEK AREA	CALIFORNIA WATER SERVICE COMPANY PUMPING PLANT Walker Avenue					Structure of Historic Significance	California Water Services company preserved original structure and converted it to an office.
WALNUT CREEK AREA	JAMES T. WALKER HOME 1200 North Gate Rd.	1200 N Gate Rd	Walnut Creek	CA	94598	Structure of Historical Significance/*Architectural** Specimen	Circa 1868, James T. Walker, nephew of Captain Joseph Reddeford, built his mansion on his 1,400 acre estate. James T. Walker was prominent in early Contra Costa politics as a member of the County's Board of Supervisors.
WALNUT CREEK AREA	BUSINESS 1332 Main Street	1332 Main St	Walnut Creek	CA	94596	Structure of Historical Significance	Site of original San Ramon Bank and place where Walnut Creek City Council held its first meeting. Corner stone date reads AD 1907.
WALNUT CREEK AREA	BURGESS RESIDENCE (RICE HOME) 1056 Hacienda Dr.	1056 Hacienda Dr.	Walnut Creek	CA	94598	Structure of Historic Significance	Site of Cibrian Adobe, owned by grandson of Juana Pacheco, grantee of San Miguel Ranch, now Ygnacia Valley. Originally built in 1860s and consisted of 25 rooms. Present home built by Rice family. Later remodeled and lived in by R. N. Burgess, developer of adjoining area called Lakewood.

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WALNUT CREEK AREA	LAWRENCE MEAT COMPANY 1423 North Main St.	1423 Main St	Walnut Creek	CA	94596	Site of Historical Significance	This structure has housed this meat selling business for three generations. It was established in 1890s and the building was constructed in 1910.
WALNUT CREEK AREA	STANLEY DOLLAR HOUSE Tice Valley Rossmoor	2799 Rossmoor Pkwy	Walnut Creek	CA	94595	Structure of Historical Significance/*Architectural** Specimen	In 1930, R. Stanley Dollars purchased the Tice Valley property and raised horses and purebred Herefords which were shown in many fairs. They also built a home which has been a show place for many years. The mansion is now the club house for the Rossmoor Leisure World residents.
WALNUT CREEK AREA	BURGESS RESIDENCE RABBIT CANNERY 962 Seven Hills Ranch Road	962 Seven Hills Ranch Rd.	Walnut Creek	CA	94598	Structure of Historical Event	"TO BE DOCUMENTED"
WALNUT CREEK AREA	MARCH BANK HORSE RANCH 1660 Ygnacio and Bancroft	1660 Ygnacio Valley Rd	Walnut Creek	CA	94598	Structure of Historical Significance/*Architectural** Specimen	Known as the Barenges Sulphur Springs in 1875, named after the Barenges Springs of the Spanish Pyrenees due to the identical chemical content of both springs. The springs were open to the public on Friday, Saturday and Sunday. Later became a hors breeding farm know as Col. March Bank's "Heather Farms."
WALNUT CREEK AREA	CHAPEL, ST. PAUL'S ESPICOPAL CHURCH Trinity Avenue	1924 Trinity Ave	Walnut Creek	CA	94596	Structure of historical Significance	St. Paul's Episcopal Church was originally on Locust Street. It was later moved to Trinity Avenue (1950).
WALNUT CREEK AREA	LEACH HOME 1837 N. Main St.	1837 N Main St	Walnut Creek	CA	94596	*Architectural** Specimen	Built in 1887, this was the home of Walnut Creek's first doctor. A two-story wood frame structure with low hip roof. Roof trim is of boxed cornice, frieze with brackets. Large Pillars support the porch and second floor balcony.
WALNUT CREEK AREA	WALNUT CREEK WOMEN'S CLUBHOUSE Corner of Carmel Drive 7 Lincoln Ave.	1470 N Broadway	Walnut Creek	CA	94596	*Architectural** Specimen	A large wood frame structure with vertical grooved rough siding. Siding overlaps at roof line and is cut to create a decorate wall design. This two-story structure has a low gable roof with louvered vents at gabled ends. Top of vents have a plain arch trim.
WALNUT CREEK AREA	BROOKSIDE VINEYARD RESIDENCE 2190 Oak Grove Blvd.	2190 Oak Grove Rd	Walnut Creek	CA	94598	Structure of Historical Significance	One of the oldest buildings in Ygnacio Valley. Site (on part of J.E. Durham Ranch, called Tres Pinos Rancho) of early vineyard planted with varietals grapes imported from Europe by Bay Area Italian families. In 1881 they incorporated as Italian Swiss Colony.
WALNUT CREEK AREA	JOHNSON RESIDENCE (SHADELANDS RANCH) 2660 Ygnacio Valley Road	2660 Ygnacio Valley Rd.	Walnut Creek	CA	94598	Structure of Historical Significance/*Architectural** Specimen	Circa 1902, H. P. Pinniman built this colonial revival ranch home patterned after a Midwestern townhouse. Once the center of a 325 acre ranch where fruit and walnuts are raised, this two-story wood frame structure has curved bays in front with curved windows. California Point of Historical Interest CCo-5. Listed on National Register of Historic Places.
WALNUT CREEK AREA	DOLE HOUSE 1614 Mt. Diablo Blvd.	1614 Mt. Diablo Blvd.	Walnut Creek	CA	94596	*Architectural** Specimen	A two-story wood from structure of Victorian style with a decorated frieze and brackets for roof trim. Roof is medium hip type with boxed cornice. Windows are two sash doubled hinge, with plain molding for surrounding detail. This is currently the location of the Walkabout Birkenstock Shoe Store. Circa 1887.

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WALNUT CREEK AREA	WALNUT CREEK SOUTHERN PACIFIC DEPOT South Broadway	850 S Broadway	Walnut Creek	CA	94596	Structure of Historical Significance/*Architectural** Specimen	Built in 1891, and opened in June 1891, this Southern Pacific Railroad Passenger and Freight Depot was part of the 29 mile San Ramon Branch, lining Tracy and Livermore main lines. Passenger service was discontinued in 1912. The two-story wood frame structure with medium gable roof and decorated roof trim has been restored, relocated and converted into a restaurant. Exterior appearance is basically the same as original structure.
WALNUT CREEK AREA	MARSHAL RESIDENCE 43 Quail Court	43 Quail Ct	Walnut Creek	CA	94596	Site Relating to Important Person in History	Originally the site of the Marshall residence. Area now known as Quail Court Office Park which includes a variety of business offices and a restaurant.
WALNUT CREEK AREA	WELCH HOUSE RESIDENCE 2190 Oak Grove Rd.	2190 Oak Grove Dr	Walnut Creek	CA	94598	Site of Important Person in History	Circa 1880, descendants of William Welch, Grantee of Rancho las Juntas, which encompassed all the area from northern Walnut Creek to Martinez, built and occupied their residence at this site. Structure was razed in the 1960s.
WALNUT CREEK AREA	ROGERS HOTEL Duncan and Main Street	1350 N Main St	Walnut Creek	CA	94572	Site of Historic Event	Built 1880, this early hotel, stage couch stop and political gathering place was owned by Walter "Ott" Rogers.
WALNUT CREEK AREA	ADAMS RESIDENCE 2030 San Miguel Dr.	2030 San Miguel Dr.	Walnut Creek	CA	94596	*Architectural** specimen	One-and-a-half story wood frame structure with wood shingle roof which is medium gable with a gablet. A triangle pediment decorates the entrance.
WALNUT CREEK AREA	BRONSON RESIDENCE 210 El Camino Corto	210 El Camino Corto	Walnut Creek	CA	94596	*Architectural** specimen	The rustic setting of this brick structure with its high gable roof of wood shingle and windmill makes this one of a kind for Walnut Creek.
WALNUT CREEK AREA	LARRIELL RESIDENCE 196 El Camino Corto	196 El Camino Corto	Walnut Creek	CA	94596	*Architectural** specimen	Structure is of Spanish style construction with stucco siding and tile roofing.
WALNUT CREEK AREA	STOW RESIDENCE 1721 Stow Avenue	1721 Stow Ave.	Walnut Creek	CA	94596	Structure of Historical Significance	James M. Stow moved to California in 1856 and after living in varied locations, settled in Walnut Creek in 1865. In 1876, he started his won business of general merchandizing. In 1877, he became notary public and postmaster of Walnut Creek. He was elected to the office of County Assessor in 1879.
PITTSBURG AREA; ANTIOCH AREA; CLAYTON AREA; CONCORD AREA; WALNUT CREEK AREA; LAFAYETTE AREA; MORAGA AREA; and ORINDA AREA	Pittsburg-Tesla Transmission Line	Linear district (5509 Kirker Pass Rd)	Pittsburg	CA	94565	Not yet evaluated for inclusion in the HRI	These 2 Pacific Gas & Electric transmission lines cover approximately 31 miles (24 miles in Contra Costa County, 7 miles in Alameda County). The subject property represents significant high-lead electrical transmission grids that link cities in Contra Costa County to substations and communities to the west in western Contra Costa County, collectively significant for their role in residential, commercial, and industrial development during an important period of growth in the region prior to and following World War II. Also significant for the steel towers' engineering.

Area	Resource/Location	Street No./Street Name	City	State	Zip Code	Evaluation Category	Significance/Importance
SAN RAMON VALLEY AREA	ROSEBROOK ESTATE 66 Stonecastle Court, Alamo	66 Stonecastle Ct	Alamo	CA	94507	Structures of Historical Significance/Architectural Specimen	The original single-family residential building for the Rosebrook estate, along with the Garden House (an accessory building), and structures such as the decorative outdoor stone walls, outdoor kitchen, pond area, and pool, were all built in 1941 by County recognized architect, Carr Jones. The buildings and structures are all part of one cohesive experience whose design is categorized as a model example of the Storybook Style. The integrity of the Storybook Style remains intact, despite past alterations. As such, the buildings and structures are eligible for the California Register under Criteria 1, a resource associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history and cultural heritage of California, and Criteria 3, a resource that embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values. The Board of Supervisors approved these buildings and structures to be placed onto the County HRI on February 7, 2017, and approved the property for a Mills Act contract on September 26, 2017.
SAN RAMON VALLEY AREA	ROSEBROOK ESTATE 67 Stonecastle Court, Alamo	67 Stonecastle Ct	Alamo	CA	94507	Structure of Historical Significance/Architectural Specimen	The Guest House for the Rosebrook estate, was built in 1952. The original designer for the estate, County recognized architect Carr Jones, came back to design the Guest House in the same already established Storybook Style. The integrity of the Storybook Style remains intact, despite past alterations. As such, the building is eligible for the California Register under Criteria 1, a resource associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history and cultural heritage of California, and Criteria 3, a resource that embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values. The Board of Supervisors approved these buildings and structures to be placed onto the County HRI on February 7, 2017, and approved the property for a Mills Act contract on September 26, 2017.
DIABLO AREA	ENGLISH TUDOR 2067 Alameda Diablo, Diablo	2067 Alameda Diablo	Diablo	CA	94528	Structure of Historical Significance/Architectural Specimen	This single-family residential building being built in 1925, which was during the period of significance for the Diablo Historic District, has attained its integrity to that period of significance and therefore, is identified as a contributory building to the Diablo Historic District. In addition, despite past alterations, the English Tudor Style remains prevalent. As such, the building is eligible for the California Register under Criteria 1, a resource associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history and cultural heritage of California, and Criteria 3, a resource that embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values. The Board of Supervisors approved this building to be placed onto the County HRI on February 7, 2017, and approved the property for a Mills Act contract on September 12, 2017.

Source: Contra Costa County 2016, HLAC 2005, NWIC 2018.

The Meaning of the Color Coding	Color Code
Resource identified in the 2016 Draft HRI	(no color code)
Resource identified in the 2016 Draft HRI whose locations could not be verified and therefore were approximated	
Resource identified in the 2016 Draft HRI that is no longer extant and is now a site of significance	
Resource identified in the 2016 Draft HRI that encompasses a larger area (e.g.., road or grouping of properties)	
Resource identified by the HLAC (post-2016 Draft HRI)	
Resource identified in 2018 updated records search (post-2016 Draft HRI); not yet evaluated for inclusion in the HRI	

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Appendix B
Archaeological Resources in Contra Costa County

Table B-1: Archaeological Resources in Contra Costa County

Primary Number	Trinomial	Resource Type	Age
P-07-000005	CA-CCO-000682H	Site	Historic
P-07-000006	CA-CCO-000683H	Site	Historic
P-07-000007	CA-CCO-000684H	Site	Historic
P-07-000008	CA-CCO-000685H	Site	Historic
P-07-000009	CA-CCO-000686H	Site	Historic
P-07-000012	CA-CCO-000689H	Site	Historic
P-07-000013	CA-CCO-000690H	Site	Historic
P-07-000014	CA-CCO-000691H	Site	Historic
P-07-000015	CA-CCO-000692H	Site	Historic
P-07-000016	CA-CCO-000693H	Site	Historic
P-07-000018	CA-CCO-000695H	Site	Historic
P-07-000209	CA-CCO-000410H	Site	Historic
P-07-000211	CA-CCO-000414H	Site	Historic
P-07-000213	CA-CCO-000418H	Site	Historic
P-07-000218	CA-CCO-000433H	Site	Historic
P-07-000224	CA-CCO-000444H	Site, Element of district	Historic
P-07-000225	CA-CCO-000445H	Structure, Site, Element of district	Historic
P-07-000226	CA-CCO-000446H	Site, Element of district	Historic
P-07-000228	CA-CCO-000448H	Site, Element of district	Historic
P-07-000229	CA-CCO-000449H	Site, Element of district	Historic
P-07-000231	CA-CCO-000451H	Structure, Site, Element of district	Historic
P-07-000234	CA-CCO-000454H	Structure, Site, Element of district	Historic
P-07-000250	CA-CCO-000471H	Site, Element of district	Historic
P-07-000254	CA-CCO-000479H	Site	Historic
P-07-000256	CA-CCO-000483H	Site	Historic
P-07-000258	CA-CCO-000485H	Site	Historic
P-07-000261	CA-CCO-000488H	Site	Historic
P-07-000262	CA-CCO-000489H	Site	Historic
P-07-000263	CA-CCO-000490H	Site	Historic
P-07-000264	CA-CCO-000491H	Site	Historic
P-07-000265	CA-CCO-000492H	Site	Historic
P-07-000268	CA-CCO-000496H	Site	Historic
P-07-000269	CA-CCO-000497H	Site	Historic
P-07-000270	CA-CCO-000498H	Site	Historic
P-07-000273	CA-CCO-000502H	Site	Historic
P-07-000274	CA-CCO-000503H	Site	Historic
P-07-000275	CA-CCO-000504H	Site	Historic
P-07-000277	CA-CCO-000506H	Site	Historic
P-07-000278	CA-CCO-000507H	Site	Historic

Primary Number	Trinomial	Resource Type	Age
P-07-000296	CA-CCO-000525H	Site	Historic
P-07-000304	CA-CCO-000533H	Site, Element of district	Historic
P-07-000305	CA-CCO-000534H	Site, Element of district	Historic
P-07-000306	CA-CCO-000535H	Site, Element of district	Historic
P-07-000307	CA-CCO-000536H	Site, Element of district	Historic
P-07-000308	CA-CCO-000537H	Site, Element of district	Historic
P-07-000312	CA-CCO-000541H	Site	Historic
P-07-000313	CA-CCO-000542H	Site	Historic
P-07-000316	CA-CCO-000545H	Site	Historic
P-07-000317	CA-CCO-000546H	Site, Element of district	Historic
P-07-000320	CA-CCO-000550H	Site	Historic
P-07-000322	CA-CCO-000552H	Site	Historic
P-07-000331	CA-CCO-000561H	Site, Element of district	Historic
P-07-000332	CA-CCO-000562H	Site, Element of district	Historic
P-07-000333	CA-CCO-000563H	Site, Element of district	Historic
P-07-000334	CA-CCO-000564H	Site, Element of district	Historic
P-07-000337	CA-CCO-000567H	Structure, Site, Element of district	Historic
P-07-000350	CA-CCO-000584H	Site	Historic
P-07-000351	CA-CCO-000585H	Structure, Site	Historic
P-07-000352	CA-CCO-000586H	Site	Historic
P-07-000353	CA-CCO-000587H	Site	Historic
P-07-000371	CA-CCO-000606H	Site	Historic
P-07-000372	CA-CCO-000607H	Site	Historic
P-07-000373	CA-CCO-000608H	Site	Historic
P-07-000375	CA-CCO-000610H	Site	Historic
P-07-000376	CA-CCO-000611H	Site	Historic
P-07-000383	CA-CCO-000618H	Site	Historic
P-07-000386	CA-CCO-000622H	Site	Historic
P-07-000388	CA-CCO-000624H	Site	Historic
P-07-000390	CA-CCO-000626H	Site	Historic
P-07-000391	CA-CCO-000627H	Site	Historic
P-07-000392	CA-CCO-000628H	Site, Element of district	Historic
P-07-000393	CA-CCO-000629H	Site, Element of district	Historic
P-07-000394	CA-CCO-000630H	Site, Element of district	Historic
P-07-000398	CA-CCO-000634H	Site	Historic
P-07-000402	CA-CCO-000638H	Site	Historic
P-07-000403	CA-CCO-000639H	Site	Historic
P-07-000405	CA-CCO-000642H	Site	Historic
P-07-000406	CA-CCO-000643H	Site	Historic
P-07-000410	CA-CCO-000650H	Site	Historic
P-07-000412	CA-CCO-000652H	Site	Historic

Primary Number	Trinomial	Resource Type	Age
P-07-000420	CA-CCO-000663H	Site	Historic
P-07-000421	CA-CCO-000664H	Site	Historic
P-07-000422	CA-CCO-000665H	Site	Historic
P-07-000423	CA-CCO-000666H	Site	Historic
P-07-000424	CA-CCO-000667H	Site	Historic
P-07-000425	CA-CCO-000668H	Site	Historic
P-07-000426	CA-CCO-000669H	Site	Historic
P-07-000427	CA-CCO-000670H	Site	Historic
P-07-000428	CA-CCO-000671H	Site	Historic
P-07-000430	CA-CCO-000673H	Site	Historic
P-07-000432	CA-CCO-000675H	Structure, Site	Historic
P-07-000434	CA-CCO-000677H	Site	Historic
P-07-000436	CA-CCO-000570H	Site	Historic
P-07-000437	CA-CCO-000571H	Site	Historic
P-07-000450	CA-CCO-000412H	Object, Site	Historic
P-07-000468	CA-CCO-000361H	Other	Historic
P-07-000475	CA-CCO-000641H	Site, District	Historic
P-07-000482	CA-CCO-000702H	Site	Historic
P-07-000484	CA-CCO-000704H	Site	Historic
P-07-000485		Structure, Site	Historic
P-07-000487		Site	Historic
P-07-000499		Other	Historic
P-07-000501		Other	Historic
P-07-000502		Other	Historic
P-07-000506		Site	Historic
P-07-000507	CA-CCO-000705H	Site	Historic
P-07-000508	CA-CCO-000712H	Site	Historic
P-07-000510	CA-CCO-000707H	Structure, Site	Historic
P-07-000511	CA-CCO-000708H	Site	Historic
P-07-000714	CA-CCO-000359H	Site	Historic
P-07-000715	CA-CCO-000360H	Site	Historic
P-07-000735	CA-CCO-000419H	Site	Historic
P-07-000745	CA-CCO-000475H	Site	Historic
P-07-000746	CA-CCO-000478H	Structure, Site	Historic
P-07-000747	CA-CCO-000480H	Site	Historic
P-07-000757	CA-CCO-000714H	Structure, Site	Historic
P-07-000763		Structure, Site	Historic
P-07-000764		Structure, Site	Historic
P-07-000765		Site	Historic
P-07-000768		Site	Historic
P-07-000772		Site	Historic

Primary Number	Trinomial	Resource Type	Age
P-07-000778		Site	Historic
P-07-000794	CA-CCO-000728H	Site	Historic
P-07-000795		Site	Historic
P-07-000800	CA-CCO-000729H	Site	Historic
P-07-000802		Site	Historic
P-07-000841		Site	Historic
P-07-000845	CA-CCO-000734H	Site	Historic
P-07-000846	CA-CCO-000808H	Site	Historic
P-07-000848		Other	Historic
P-07-000849	CA-CCO-000735H	Site	Historic
P-07-000870		Site	Historic
P-07-000874		Site	Historic
P-07-000878		Site	Historic
P-07-000914		Other	Historic
P-07-001008		Site	Historic
P-07-001011		Site	Historic
P-07-001039		Site, Element of district	Historic
P-07-002039		Site	Historic
P-07-002402		Structure, Site	Historic
P-07-002412		Site	Historic
P-07-002545	CA-CCO-000745H	Structure, Site	Historic
P-07-002561		Structure, Site	Historic
P-07-002563		Site	Historic
P-07-002564	CA-CCO-000747H	Site	Historic
P-07-002565	CA-CCO-000748H	Site	Historic
P-07-002588	CA-CCO-000751H	Structure, Site	Historic
P-07-002598		Site	Historic
P-07-002599	CA-CCO-000757H	Structure, Object, Site	Historic
P-07-002601	CA-CCO-000759H	Site	Historic
P-07-002602	CA-CCO-000760H	Site	Historic
P-07-002603	CA-CCO-000761H	Site	Historic
P-07-002645	CA-CCO-000765H	Object, Site	Historic
P-07-002646	CA-CCO-000766H	Object, Site	Historic
P-07-002655		Site	Historic
P-07-002669	CA-CCO-000769H	Structure, Site	Historic
P-07-002674		Site	Historic
P-07-002675		Site	Historic
P-07-002676		Object, Site	Historic
P-07-002677		Site	Historic
P-07-002683	CA-CCO-000790H	Structure, Site	Historic
P-07-002687	CA-CCO-000771H	Site	Historic

Primary Number	Trinomial	Resource Type	Age
P-07-002688		Other	Historic
P-07-002708		Structure, Site	Historic
P-07-002748		Site	Historic
P-07-002749		Site	Historic
P-07-002758		Other	Historic
P-07-002760		Site	Historic
P-07-002852	CA-CCO-000776H	Site	Historic
P-07-002856	CA-CCO-000777H	Site	Historic
P-07-002857	CA-CCO-000778H	Site	Historic
P-07-002858	CA-CCO-000779H	Site	Historic
P-07-002859	CA-CCO-000780H	Site	Historic
P-07-002860	CA-CCO-000781H	Site	Historic
P-07-002861	CA-CCO-000782H	Site	Historic
P-07-002862	CA-CCO-000783H	Site	Historic
P-07-002863	CA-CCO-000784H	Site	Historic
P-07-002864	CA-CCO-000785H	Site	Historic
P-07-002866	CA-CCO-000787H	Site	Historic
P-07-002867	CA-CCO-000788H	Site	Historic
P-07-002868	CA-CCO-000789H	Site	Historic
P-07-002870	CA-CCO-000791H	Site	Historic
P-07-002871	CA-CCO-000792H	Site	Historic
P-07-002872	CA-CCO-000793H	Site	Historic
P-07-002873	CA-CCO-000794H	Site	Historic
P-07-002876		Site	Historic
P-07-002919		Site	Historic
P-07-002921		Site	Historic
P-07-002929		Other	Historic
P-07-002930		Other	Historic
P-07-002931		Other	Historic
P-07-002940	CA-CCO-000803H	Site	Historic
P-07-002941	CA-CCO-000804H	Site	Historic
P-07-002952		Site	Historic
P-07-002957		Site	Historic
P-07-002958		Site	Historic
P-07-002959		Site	Historic
P-07-002960		Site	Historic
P-07-002961		Site	Historic
P-07-002962		Site	Historic
P-07-002964		Site	Historic
P-07-002965		Site	Historic
P-07-002966		Site	Historic

Primary Number	Trinomial	Resource Type	Age
P-07-002967		Site	Historic
P-07-002968		Site	Historic
P-07-002969		Site	Historic
P-07-002970		Site	Historic
P-07-002971		Site	Historic
P-07-002973		Object	Historic
P-07-002974		Site	Historic
P-07-002975		Site	Historic
P-07-002976		Site	Historic
P-07-002980		Structure, Site	Historic
P-07-002984		Structure, Site	Historic
P-07-002985		Structure, Site	Historic
P-07-002992		Site	Historic
P-07-003001		Other	Historic
P-07-003002		Site	Historic
P-07-003017	CA-CCO-000814H	Structure, Site	Historic
P-07-003054		Site	Historic
P-07-003060		Site	Historic
P-07-003067		Other	Historic
P-07-003071	CA-CCO-000816H	Site	Historic
P-07-003077		Other	Historic
P-07-003084	CA-CCO-000818H	Site, District	Historic
P-07-004485	CA-CCO-000824H	Site	Historic
P-07-004487	CA-CCO-000825H	Site	Historic
P-07-004493		Site, Element of district	Historic
P-07-004497	CA-CCO-000826H	Structure, Site	Historic
P-07-004507		Structure, Site	Historic
P-07-004512	CA-CCO-000829H	Structure, Site	Historic
P-07-004513	CA-CCO-000830H	Structure, Site	Historic
P-07-004514	CA-CCO-000831H	Site	Historic
P-07-004515		Other	Historic
P-07-004516		Site	Historic
P-07-004517		Site	Historic
P-07-004518		Site	Historic
P-07-004519		Site	Historic
P-07-004520		Site	Historic
P-07-004521		Other	Historic
P-07-004522		Other	Historic
P-07-004530		Site	Historic
P-07-004532	CA-CCO-000841H	Site	Historic
P-07-004535		Other	Historic

Primary Number	Trinomial	Resource Type	Age
P-07-004536		Site	Historic
P-07-004538		Other	Historic
P-07-004539	CA-CCO-000833H	Site	Historic
P-07-004540		Structure, Site	Historic
P-07-004541		Structure, Site	Historic
P-07-004543	CA-CCO-000834H	Site	Historic
P-07-004596		Site	Historic
P-07-004597		Object	Historic
P-07-004616	CA-CCO-000835H	Site	Historic
P-07-004617	CA-CCO-000836H	Site	Historic
P-07-004618		Site	Historic
P-07-004622		Object, Site, Other	Historic
P-07-004623		Other	Historic
P-07-004624		Other	Historic
P-07-004626		Other	Historic
P-07-004627		Other	Historic
P-07-004628		Other	Historic
P-07-004629		Other	Historic
P-07-004666		Site, Element of district	Historic
P-07-004672		Site, Element of district	Historic
P-07-004695	CA-CCO-000839H	Site	Historic
P-07-004696	CA-CCO-000840H	Site	Historic
P-07-004717		Site	Historic
P-07-004740		Site	Historic
P-07-004741		Site	Historic
P-07-004742		Site	Historic
P-07-004743		Site	Historic
P-07-004758		Object	Historic
P-07-004823		Site	Historic
P-07-004829	CA-CCO-000850H	Site	Historic
P-07-000002	CA-CCO-000595	Site	Prehistoric
P-07-000003	CA-CCO-000680	Site	Prehistoric
P-07-000019	CA-CCO-000696	Site	Prehistoric
P-07-000021	CA-CCO-000001	Site	Prehistoric
P-07-000023	CA-CCO-000003	Site	Prehistoric
P-07-000024	CA-CCO-000004	Site	Prehistoric
P-07-000025	CA-CCO-000005	Site	Prehistoric
P-07-000026	CA-CCO-000006	Site, Element of district	Prehistoric
P-07-000027	CA-CCO-000007	Site	Prehistoric
P-07-000028	CA-CCO-000008	Object	Prehistoric
P-07-000029	CA-CCO-000009	Site, Element of district	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000031	CA-CCO-000011	Site	Prehistoric
P-07-000032	CA-CCO-000012	Site	Prehistoric
P-07-000033	CA-CCO-000014	Site	Prehistoric
P-07-000034	CA-CCO-000015	Site	Prehistoric
P-07-000035	CA-CCO-000016	Site	Prehistoric
P-07-000036	CA-CCO-000017	Site	Prehistoric
P-07-000038	CA-CCO-000019	Site	Prehistoric
P-07-000039	CA-CCO-000020	Site	Prehistoric
P-07-000040	CA-CCO-000021	Site	Prehistoric
P-07-000041	CA-CCO-000022	Site	Prehistoric
P-07-000042	CA-CCO-000023	Site	Prehistoric
P-07-000043	CA-CCO-000024	Site	Prehistoric
P-07-000044	CA-CCO-000026	Site	Prehistoric
P-07-000045	CA-CCO-000027	Site	Prehistoric
P-07-000046	CA-CCO-000029	Site	Prehistoric
P-07-000047	CA-CCO-000030	Site	Prehistoric
P-07-000048	CA-CCO-000031	Site	Prehistoric
P-07-000049	CA-CCO-000032	Site	Prehistoric
P-07-000050	CA-CCO-000033	Site	Prehistoric
P-07-000051	CA-CCO-000034	Site	Prehistoric
P-07-000052	CA-CCO-000035	Site	Prehistoric
P-07-000053	CA-CCO-000036	Site	Prehistoric
P-07-000054	CA-CCO-000037	Site	Prehistoric
P-07-000055	CA-CCO-000038	Site	Prehistoric
P-07-000056	CA-CCO-000039	Site	Prehistoric
P-07-000057	CA-CCO-000040	Site	Prehistoric
P-07-000058	CA-CCO-000041	Site	Prehistoric
P-07-000059	CA-CCO-000042	Site	Prehistoric
P-07-000060	CA-CCO-000043	Site	Prehistoric
P-07-000061	CA-CCO-000044	Site	Prehistoric
P-07-000062	CA-CCO-000045	Site	Prehistoric
P-07-000063	CA-CCO-000046	Site	Prehistoric
P-07-000064	CA-CCO-000047	Site	Prehistoric
P-07-000065	CA-CCO-000048	Site	Prehistoric
P-07-000066	CA-CCO-000124	Site	Prehistoric
P-07-000068	CA-CCO-000126	Site	Prehistoric
P-07-000069	CA-CCO-000127	Site	Prehistoric
P-07-000070	CA-CCO-000128	Site	Prehistoric
P-07-000072	CA-CCO-000130	Site	Prehistoric
P-07-000073	CA-CCO-000131	Site	Prehistoric
P-07-000074	CA-CCO-000132	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000075	CA-CCO-000133	Site	Prehistoric
P-07-000076	CA-CCO-000134	Site	Prehistoric
P-07-000077	CA-CCO-000135	Site	Prehistoric
P-07-000078	CA-CCO-000136	Site	Prehistoric
P-07-000079	CA-CCO-000137	Site	Prehistoric
P-07-000080	CA-CCO-000138	Site, Element of district	Prehistoric
P-07-000082	CA-CCO-000140	Site	Prehistoric
P-07-000083	CA-CCO-000141	Site	Prehistoric
P-07-000084	CA-CCO-000142	Site	Prehistoric
P-07-000085	CA-CCO-000143	Site	Prehistoric
P-07-000086	CA-CCO-000144	Site	Prehistoric
P-07-000087	CA-CCO-000145	Site	Prehistoric
P-07-000088	CA-CCO-000146	Site	Prehistoric
P-07-000089	CA-CCO-000147	Site	Prehistoric
P-07-000091	CA-CCO-000149	Site	Prehistoric
P-07-000092	CA-CCO-000150	Site	Prehistoric
P-07-000093	CA-CCO-000151	Site	Prehistoric
P-07-000094	CA-CCO-000152	Site	Prehistoric
P-07-000095	CA-CCO-000153	Site	Prehistoric
P-07-000096	CA-CCO-000154	Site	Prehistoric
P-07-000097	CA-CCO-000155	Site	Prehistoric
P-07-000098	CA-CCO-000156	Site	Prehistoric
P-07-000099	CA-CCO-000157	Site	Prehistoric
P-07-000106	CA-CCO-000223	Site	Prehistoric
P-07-000108	CA-CCO-000225	Site	Prehistoric
P-07-000109	CA-CCO-000226	Site	Prehistoric
P-07-000110	CA-CCO-000227	Site	Prehistoric
P-07-000111	CA-CCO-000228	Site	Prehistoric
P-07-000112	CA-CCO-000230	Site	Prehistoric
P-07-000113	CA-CCO-000231	Site	Prehistoric
P-07-000114	CA-CCO-000232	Site	Prehistoric
P-07-000115	CA-CCO-000233	Site	Prehistoric
P-07-000116	CA-CCO-000234	Site	Prehistoric
P-07-000117	CA-CCO-000235	Site	Prehistoric
P-07-000118	CA-CCO-000236	Site	Prehistoric
P-07-000119	CA-CCO-000237	Site	Prehistoric
P-07-000120	CA-CCO-000238	Site	Prehistoric
P-07-000121	CA-CCO-000239	Site	Prehistoric
P-07-000122	CA-CCO-000240	Site	Prehistoric
P-07-000124	CA-CCO-000242	Site	Prehistoric
P-07-000125	CA-CCO-000243	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000126	CA-CCO-000244	Site	Prehistoric
P-07-000127	CA-CCO-000245	Site	Prehistoric
P-07-000128	CA-CCO-000247	Site	Prehistoric
P-07-000129	CA-CCO-000248	Site	Prehistoric
P-07-000130	CA-CCO-000249	Site	Prehistoric
P-07-000131	CA-CCO-000250	Site	Prehistoric
P-07-000132	CA-CCO-000251	Site	Prehistoric
P-07-000133	CA-CCO-000252	Site	Prehistoric
P-07-000134	CA-CCO-000253	Site	Prehistoric
P-07-000135	CA-CCO-000254	Site	Prehistoric
P-07-000136	CA-CCO-000256	Site	Prehistoric
P-07-000137	CA-CCO-000257	Site	Prehistoric
P-07-000138	CA-CCO-000258	Site	Prehistoric
P-07-000139	CA-CCO-000260	Site	Prehistoric
P-07-000140	CA-CCO-000261	Site	Prehistoric
P-07-000141	CA-CCO-000262	Site	Prehistoric
P-07-000142	CA-CCO-000263	Site	Prehistoric
P-07-000143	CA-CCO-000264	Site	Prehistoric
P-07-000144	CA-CCO-000265	Site	Prehistoric
P-07-000145	CA-CCO-000266	Site	Prehistoric
P-07-000146	CA-CCO-000267	Site	Prehistoric
P-07-000148	CA-CCO-000269	Site, Element of district	Prehistoric
P-07-000149	CA-CCO-000270	Site, Element of district	Prehistoric
P-07-000150	CA-CCO-000271	Site, Element of district	Prehistoric
P-07-000152	CA-CCO-000273	Site	Prehistoric
P-07-000154	CA-CCO-000275	Site	Prehistoric
P-07-000155	CA-CCO-000276	Site	Prehistoric
P-07-000156	CA-CCO-000277	Site	Prehistoric
P-07-000157	CA-CCO-000278	Site	Prehistoric
P-07-000158	CA-CCO-000279	Site	Prehistoric
P-07-000159	CA-CCO-000280	Site	Prehistoric
P-07-000160	CA-CCO-000281	Site	Prehistoric
P-07-000161	CA-CCO-000282	Site	Prehistoric
P-07-000162	CA-CCO-000283	Site	Prehistoric
P-07-000163	CA-CCO-000285	Site	Prehistoric
P-07-000164	CA-CCO-000286	Site	Prehistoric
P-07-000165	CA-CCO-000287	Site	Prehistoric
P-07-000166	CA-CCO-000288	Site	Prehistoric
P-07-000167	CA-CCO-000289	Site	Prehistoric
P-07-000168	CA-CCO-000290	Site	Prehistoric
P-07-000169	CA-CCO-000291	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000170	CA-CCO-000292	Site	Prehistoric
P-07-000171	CA-CCO-000293	Site	Prehistoric
P-07-000172	CA-CCO-000294	Site	Prehistoric
P-07-000173	CA-CCO-000295	Site	Prehistoric
P-07-000174	CA-CCO-000297	Site	Prehistoric
P-07-000175	CA-CCO-000298	Site	Prehistoric
P-07-000176	CA-CCO-000299	Site	Prehistoric
P-07-000177	CA-CCO-000300	Site	Prehistoric
P-07-000178	CA-CCO-000301	Site	Prehistoric
P-07-000179	CA-CCO-000302	Site	Prehistoric
P-07-000180	CA-CCO-000303	Site	Prehistoric
P-07-000181	CA-CCO-000304	Site	Prehistoric
P-07-000182	CA-CCO-000305	Site	Prehistoric
P-07-000183	CA-CCO-000306	Site	Prehistoric
P-07-000184	CA-CCO-000307	Site	Prehistoric
P-07-000185	CA-CCO-000308	Site	Prehistoric
P-07-000186	CA-CCO-000309	Site	Prehistoric
P-07-000187	CA-CCO-000310	Site, Element of district	Prehistoric
P-07-000188	CA-CCO-000312	Site	Prehistoric
P-07-000190	CA-CCO-000352	Site	Prehistoric
P-07-000191	CA-CCO-000369	Site	Prehistoric
P-07-000192	CA-CCO-000371	Site	Prehistoric
P-07-000193	CA-CCO-000375	Site	Prehistoric
P-07-000194	CA-CCO-000385	Site	Prehistoric
P-07-000195	CA-CCO-000386	Site	Prehistoric
P-07-000197	CA-CCO-000397	Site, Element of district	Prehistoric
P-07-000198	CA-CCO-000398	Site, Element of district	Prehistoric
P-07-000199	CA-CCO-000399	Site, Element of district	Prehistoric
P-07-000200	CA-CCO-000401	Site	Prehistoric
P-07-000201	CA-CCO-000402	Site	Prehistoric
P-07-000205	CA-CCO-000406	Site	Prehistoric
P-07-000210	CA-CCO-000411	Site	Prehistoric
P-07-000212	CA-CCO-000417	Site, Element of district	Prehistoric
P-07-000216	CA-CCO-000428	Site, Element of district	Prehistoric
P-07-000217	CA-CCO-000431	Site	Prehistoric
P-07-000220	CA-CCO-000437	Site	Prehistoric
P-07-000222	CA-CCO-000439	Site	Prehistoric
P-07-000232	CA-CCO-000452	Site, Element of district	Prehistoric
P-07-000235	CA-CCO-000455	Site, Element of district	Prehistoric
P-07-000236	CA-CCO-000456	Site, Element of district	Prehistoric
P-07-000237	CA-CCO-000457	Site, Element of district	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000239	CA-CCO-000459	Site, Element of district	Prehistoric
P-07-000241	CA-CCO-000461	Site, Element of district	Prehistoric
P-07-000242	CA-CCO-000462	Site, Element of district	Prehistoric
P-07-000243	CA-CCO-000463	Site, Element of district	Prehistoric
P-07-000244	CA-CCO-000464	Site, Element of district	Prehistoric
P-07-000245	CA-CCO-000465	Site, Element of district	Prehistoric
P-07-000247	CA-CCO-000468	Site, Element of district	Prehistoric
P-07-000248	CA-CCO-000469	Site, Element of district	Prehistoric
P-07-000251	CA-CCO-000473	Site	Prehistoric
P-07-000255	CA-CCO-000482	Site	Prehistoric
P-07-000257	CA-CCO-000484	Site	Prehistoric
P-07-000259	CA-CCO-000486	Site	Prehistoric
P-07-000260	CA-CCO-000487	Site	Prehistoric
P-07-000266	CA-CCO-000493	Site	Prehistoric
P-07-000267	CA-CCO-000495	Site	Prehistoric
P-07-000271	CA-CCO-000500	Site	Prehistoric
P-07-000272	CA-CCO-000501	Site	Prehistoric
P-07-000276	CA-CCO-000505	Site	Prehistoric
P-07-000280	CA-CCO-000509	Site	Prehistoric
P-07-000281	CA-CCO-000510	Site	Prehistoric
P-07-000284	CA-CCO-000513	Site	Prehistoric
P-07-000285	CA-CCO-000514	Site	Prehistoric
P-07-000286	CA-CCO-000515	Site	Prehistoric
P-07-000287	CA-CCO-000516	Site	Prehistoric
P-07-000288	CA-CCO-000517	Site	Prehistoric
P-07-000289	CA-CCO-000518	Site	Prehistoric
P-07-000290	CA-CCO-000519	Site	Prehistoric
P-07-000291	CA-CCO-000520	Site	Prehistoric
P-07-000292	CA-CCO-000521	Site	Prehistoric
P-07-000293	CA-CCO-000522	Site	Prehistoric
P-07-000294	CA-CCO-000523	Site	Prehistoric
P-07-000295	CA-CCO-000524	Site	Prehistoric
P-07-000297	CA-CCO-000526	Site	Prehistoric
P-07-000298	CA-CCO-000527	Site	Prehistoric
P-07-000299	CA-CCO-000528	Site	Prehistoric
P-07-000300	CA-CCO-000529	Site	Prehistoric
P-07-000301	CA-CCO-000530	Site	Prehistoric
P-07-000302	CA-CCO-000531	Site	Prehistoric
P-07-000309	CA-CCO-000538	Site	Prehistoric
P-07-000310	CA-CCO-000539	Site	Prehistoric
P-07-000311	CA-CCO-000540	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000315	CA-CCO-000544	Site	Prehistoric
P-07-000318	CA-CCO-000547	Site	Prehistoric
P-07-000319	CA-CCO-000549	Site	Prehistoric
P-07-000321	CA-CCO-000551	Site	Prehistoric
P-07-000324	CA-CCO-000554	Site, Element of district	Prehistoric
P-07-000325	CA-CCO-000555	Site, Element of district	Prehistoric
P-07-000326	CA-CCO-000556	Site, Element of district	Prehistoric
P-07-000327	CA-CCO-000557	Site, Element of district	Prehistoric
P-07-000328	CA-CCO-000558	Site, Element of district	Prehistoric
P-07-000329	CA-CCO-000559	Site, Element of district	Prehistoric
P-07-000338	CA-CCO-000568	Site, Element of district	Prehistoric
P-07-000341	CA-CCO-000574	Site	Prehistoric
P-07-000342	CA-CCO-000575	Site	Prehistoric
P-07-000343	CA-CCO-000576	Site	Prehistoric
P-07-000344	CA-CCO-000577	Site	Prehistoric
P-07-000345	CA-CCO-000578	Site	Prehistoric
P-07-000346	CA-CCO-000579	Site	Prehistoric
P-07-000347	CA-CCO-000580	Site	Prehistoric
P-07-000348	CA-CCO-000581	Site	Prehistoric
P-07-000354	CA-CCO-000588	Site	Prehistoric
P-07-000355	CA-CCO-000589	Site	Prehistoric
P-07-000356	CA-CCO-000590	Site	Prehistoric
P-07-000357	CA-CCO-000591	Site	Prehistoric
P-07-000358	CA-CCO-000592	Site	Prehistoric
P-07-000359	CA-CCO-000593	Site	Prehistoric
P-07-000360	CA-CCO-000594	Site	Prehistoric
P-07-000362	CA-CCO-000597	Site	Prehistoric
P-07-000363	CA-CCO-000598	Site	Prehistoric
P-07-000364	CA-CCO-000599	Site	Prehistoric
P-07-000365	CA-CCO-000600	Site	Prehistoric
P-07-000367	CA-CCO-000602	Site	Prehistoric
P-07-000369	CA-CCO-000604	Site	Prehistoric
P-07-000370	CA-CCO-000605	Site	Prehistoric
P-07-000374	CA-CCO-000609	Site	Prehistoric
P-07-000377	CA-CCO-000612	Site	Prehistoric
P-07-000378	CA-CCO-000613	Site	Prehistoric
P-07-000379	CA-CCO-000614	Site	Prehistoric
P-07-000381	CA-CCO-000616	Site	Prehistoric
P-07-000382	CA-CCO-000617	Site, Element of district	Prehistoric
P-07-000384	CA-CCO-000619	Site	Prehistoric
P-07-000389	CA-CCO-000625	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000395	CA-CCO-000631	Site	Prehistoric
P-07-000396	CA-CCO-000632	Site	Prehistoric
P-07-000399	CA-CCO-000635	Site	Prehistoric
P-07-000400	CA-CCO-000636	Site, Element of district	Prehistoric
P-07-000401	CA-CCO-000637	Site, Element of district	Prehistoric
P-07-000408	CA-CCO-000647	Site	Prehistoric
P-07-000409	CA-CCO-000649	Site	Prehistoric
P-07-000413	CA-CCO-000653	Site	Prehistoric
P-07-000414	CA-CCO-000657	Site	Prehistoric
P-07-000415	CA-CCO-000658	Site	Prehistoric
P-07-000416	CA-CCO-000659	Site	Prehistoric
P-07-000417	CA-CCO-000660	Site	Prehistoric
P-07-000418	CA-CCO-000661	Site	Prehistoric
P-07-000419	CA-CCO-000662	Site	Prehistoric
P-07-000435	CA-CCO-000678	Site	Prehistoric
P-07-000439	CA-CCO-000255	Site	Prehistoric
P-07-000440	CA-CCO-000259	Site	Prehistoric
P-07-000441	CA-CCO-000284	Site	Prehistoric
P-07-000442	CA-CCO-000351	Site	Prehistoric
P-07-000443	CA-CCO-000370	Object, Site	Prehistoric
P-07-000444	CA-CCO-000378	Site	Prehistoric
P-07-000445	CA-CCO-000379	Site	Prehistoric
P-07-000446	CA-CCO-000380	Site	Prehistoric
P-07-000447	CA-CCO-000389	Site	Prehistoric
P-07-000448	CA-CCO-000390	Site	Prehistoric
P-07-000449	CA-CCO-000391	Site	Prehistoric
P-07-000451	CA-CCO-000413	Site	Prehistoric
P-07-000452	CA-CCO-000420	Site	Prehistoric
P-07-000453	CA-CCO-000421	Site	Prehistoric
P-07-000455	CA-CCO-000423	Site	Prehistoric
P-07-000456	CA-CCO-000432	Site	Prehistoric
P-07-000457	CA-CCO-000436	Site	Prehistoric
P-07-000460	CA-CCO-000481	Site	Prehistoric
P-07-000461	CA-CCO-000654	Site, Element of district	Prehistoric
P-07-000462	CA-CCO-000655	Site, Element of district	Prehistoric
P-07-000463	CA-CCO-000679	Site	Prehistoric
P-07-000466	CA-CCO-000357	Site	Prehistoric
P-07-000469	CA-CCO-000367	Site	Prehistoric
P-07-000470	CA-CCO-000372	Site	Prehistoric
P-07-000471	CA-CCO-000374	Site	Prehistoric
P-07-000472	CA-CCO-000381	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000473	CA-CCO-000387	Site	Prehistoric
P-07-000474	CA-CCO-000392	Site	Prehistoric
P-07-000478		Site	Prehistoric
P-07-000479	CA-CCO-000700	Site	Prehistoric
P-07-000481	CA-CCO-000356	Site	Prehistoric
P-07-000516		Other	Prehistoric
P-07-000519		Other	Prehistoric
P-07-000532		Site	Prehistoric
P-07-000534	CA-CCO-000013	Site	Prehistoric
P-07-000535	CA-CCO-000025	Site	Prehistoric
P-07-000539	CA-CCO-000051	Site	Prehistoric
P-07-000661	CA-CCO-000207	Site	Prehistoric
P-07-000671	CA-CCO-000229	Site	Prehistoric
P-07-000672	CA-CCO-000246	Site	Prehistoric
P-07-000674	CA-CCO-000311	Site	Prehistoric
P-07-000708	CA-CCO-000347	Site	Prehistoric
P-07-000709	CA-CCO-000348	Site	Prehistoric
P-07-000711	CA-CCO-000350	Site	Prehistoric
P-07-000716	CA-CCO-000362	Site	Prehistoric
P-07-000717	CA-CCO-000363	Site	Prehistoric
P-07-000718	CA-CCO-000364	Site	Prehistoric
P-07-000719	CA-CCO-000365	Site	Prehistoric
P-07-000720	CA-CCO-000366	Site	Prehistoric
P-07-000721	CA-CCO-000368	Site	Prehistoric
P-07-000724	CA-CCO-000377	Site	Prehistoric
P-07-000725	CA-CCO-000382	Site	Prehistoric
P-07-000726	CA-CCO-000383	Site	Prehistoric
P-07-000727	CA-CCO-000384	Site	Prehistoric
P-07-000728	CA-CCO-000393	Site	Prehistoric
P-07-000729	CA-CCO-000394	Site	Prehistoric
P-07-000730	CA-CCO-000395	Site	Prehistoric
P-07-000731	CA-CCO-000396	Site	Prehistoric
P-07-000732	CA-CCO-000400	Site	Prehistoric
P-07-000733	CA-CCO-000415	Site	Prehistoric
P-07-000734	CA-CCO-000416	Site	Prehistoric
P-07-000736	CA-CCO-000424	Site	Prehistoric
P-07-000738	CA-CCO-000429	Site	Prehistoric
P-07-000739	CA-CCO-000430	Site	Prehistoric
P-07-000742	CA-CCO-000442	Site	Prehistoric
P-07-000743	CA-CCO-000466	Site	Prehistoric
P-07-000744	CA-CCO-000472	Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-000750	CA-CCO-000572	Site	Prehistoric
P-07-000766	CA-CCO-000716	Site	Prehistoric
P-07-000774		Other	Prehistoric
P-07-000777	CA-CCO-000719	Site, Element of district	Prehistoric
P-07-000779	CA-CCO-000720	Site, Element of district	Prehistoric
P-07-000786	CA-CCO-000721	Site	Prehistoric
P-07-000787	CA-CCO-000722	Site	Prehistoric
P-07-000788	CA-CCO-000723	Site	Prehistoric
P-07-000789	CA-CCO-000724	Site	Prehistoric
P-07-000790	CA-CCO-000725	Site	Prehistoric
P-07-000793	CA-CCO-000727	Site	Prehistoric
P-07-000844		Other	Prehistoric
P-07-000850		Site	Prehistoric
P-07-000851	CA-CCO-000736	Site	Prehistoric
P-07-000861		Object, Site	Prehistoric
P-07-000865		Site	Prehistoric
P-07-002544	CA-CCO-000847	Site	Prehistoric
P-07-002569		Site	Prehistoric
P-07-002570	CA-CCO-000750	Site	Prehistoric
P-07-002580		Site, Other	Prehistoric
P-07-002581		Site	Prehistoric
P-07-002584		Object	Prehistoric
P-07-002585		Site	Prehistoric
P-07-002586		Site	Prehistoric
P-07-002589		Site	Prehistoric
P-07-002594	CA-CCO-000756	Site	Prehistoric
P-07-002600	CA-CCO-000758	Site	Prehistoric
P-07-002607	CA-CCO-000762	Site	Prehistoric
P-07-002639		Site	Prehistoric
P-07-002640		Element of district, Other	Prehistoric
P-07-002650	CA-CCO-000767	Site	Prehistoric
P-07-002671	CA-CCO-000770	Site	Prehistoric
P-07-002693	CA-CCO-000774	Site	Prehistoric
P-07-002714		Site	Prehistoric
P-07-002717		Site	Prehistoric
P-07-002718	CA-CCO-000775	Site	Prehistoric
P-07-002744		Object	Prehistoric
P-07-002755	CA-CCO-000763	Site	Prehistoric
P-07-002756		Other	Prehistoric
P-07-002757		Object, Other	Prehistoric
P-07-002761		Site	Prehistoric

Primary Number	Trinomial	Resource Type	Age
P-07-002865	CA-CCO-000786	Site	Prehistoric
P-07-002874		Other	Prehistoric
P-07-002875		Other	Prehistoric
P-07-002897		Other	Prehistoric
P-07-002933	CA-CCO-000797	Site	Prehistoric
P-07-002934	CA-CCO-000798	Site	Prehistoric
P-07-002935	CA-CCO-000799	Site	Prehistoric
P-07-002936	CA-CCO-000800	Site	Prehistoric
P-07-002937	CA-CCO-000801	Site	Prehistoric
P-07-002939	CA-CCO-000802	Site	Prehistoric
P-07-002963		Site	Prehistoric
P-07-002989	CA-CCO-000809	Site	Prehistoric
P-07-002990	CA-CCO-000810	Site	Prehistoric
P-07-003064		Site	Prehistoric
P-07-003065		Site	Prehistoric
P-07-003068		Site	Prehistoric
P-07-003069		Site	Prehistoric
P-07-003086	CA-CCO-000819	Site	Prehistoric
P-07-003120		Other	Prehistoric
P-07-004508		Other	Prehistoric
P-07-004524		Site	Prehistoric
P-07-004537	CA-CCO-000832	Site	Prehistoric
P-07-004625		Other	Prehistoric
P-07-004714		Site	Prehistoric
P-07-004718	CA-CCO-000845	Site	Prehistoric
P-07-004739		Other	Prehistoric
P-07-004744		Site	Prehistoric
P-07-004757		Other	Prehistoric
P-07-004759		Other	Prehistoric
P-07-004760		Other	Prehistoric
P-07-004761		Other	Prehistoric
P-07-004762		Other	Prehistoric
P-07-004763		Other	Prehistoric
P-07-004764		Other	Prehistoric
P-07-004765		Other	Prehistoric
P-07-004837	CA-CCO-000851	Site	Prehistoric
P-07-004838		Other	Prehistoric
P-07-004839		Other	Prehistoric
P-07-000081	CA-CCO-000139/H	Site	Prehistoric, Historic

Primary Number	Trinomial	Resource Type	Age
P-07-000090	CA-CCO-000148/H	Site	Prehistoric, Historic
P-07-000189	CA-CCO-000320/H	Site	Prehistoric, Historic
P-07-000202	CA-CCO-000403/H	Site	Prehistoric, Historic
P-07-000203	CA-CCO-000404/H	Site	Prehistoric, Historic
P-07-000206	CA-CCO-000407/H	Site	Prehistoric, Historic
P-07-000207	CA-CCO-000408/H	Site	Prehistoric, Historic
P-07-000208	CA-CCO-000409/H	Site	Prehistoric, Historic
P-07-000219	CA-CCO-000434/H	Site, Element of district	Prehistoric, Historic
P-07-000227	CA-CCO-000447/H	Site, Element of district	Prehistoric, Historic
P-07-000233	CA-CCO-000453/H	Site, Element of district	Prehistoric, Historic
P-07-000238	CA-CCO-000458/H	Site, Element of district	Prehistoric, Historic
P-07-000240	CA-CCO-000460/H	Site, Element of district	Prehistoric, Historic
P-07-000246	CA-CCO-000467/H	Site, Element of district	Prehistoric, Historic
P-07-000253	CA-CCO-000477/H	Site, Element of district	Prehistoric, Historic
P-07-000283	CA-CCO-000512/H	Site	Prehistoric, Historic
P-07-000314	CA-CCO-000543/H	Site, Element of district	Prehistoric, Historic
P-07-000323	CA-CCO-000553/H	Site, Element of district	Prehistoric, Historic
P-07-000330	CA-CCO-000560/H	Site, Element of district	Prehistoric, Historic
P-07-000336	CA-CCO-000566/H	Site, Element of district	Prehistoric, Historic
P-07-000340	CA-CCO-000573/H	Site, District	Prehistoric, Historic
P-07-000385	CA-CCO-000621/H	Site	Prehistoric, Historic
P-07-000397	CA-CCO-000633/H	Site	Prehistoric, Historic
P-07-000404	CA-CCO-000640/H	Site	Prehistoric, Historic

Primary Number	Trinomial	Resource Type	Age
P-07-000433	CA-CCO-000676/H	Site	Prehistoric, Historic
P-07-000458	CA-CCO-000441/H	Site	Prehistoric, Historic
P-07-000459	CA-CCO-000474/H	Site	Prehistoric, Historic
P-07-000464	CA-CCO-000355/H	Site	Prehistoric, Historic
P-07-000767	CA-CCO-000717/H	Structure, Site	Prehistoric, Historic
P-07-000769		Site	Prehistoric, Historic
P-07-000780		Site	Prehistoric, Historic
P-07-000792	CA-CCO-000726/H	Site	Prehistoric, Historic
P-07-002556		Other	Prehistoric, Historic
P-07-002579		Structure, Site	Prehistoric, Historic
P-07-002592	CA-CCO-000755/H	Site	Prehistoric, Historic
P-07-002614	CA-CCO-000764/H	Site	Prehistoric, Historic
P-07-002668	CA-CCO-000768/H	Site	Prehistoric, Historic
P-07-002692	CA-CCO-000773/H	Site	Prehistoric, Historic
P-07-002932	CA-CCO-000796/H	Site	Prehistoric, Historic
P-07-003087	CA-CCO-000820/H	Structure, Site	Prehistoric, Historic
P-07-004506	CA-CCO-000827/H	Site	Prehistoric, Historic
P-07-004619	CA-CCO-000837/H	Site	Prehistoric, Historic
P-07-004724		Site	Prehistoric, Historic
P-07-004735		Site	Prehistoric, Historic
P-07-004746	CA-CCO-000846/H	Site	Prehistoric, Historic
P-07-004821	CA-CCO-000849/H	Site	Prehistoric, Historic
P-07-000483	CA-CCO-000703/H	Site	Prehistoric, Historic, Unknown

Primary Number	Trinomial	Resource Type	Age
P-07-000737	CA-CCO-000425/H	Site	Prehistoric, Historic, Unknown
P-07-000104	CA-CCO-000221	Site	Prehistoric, Protohistoric
P-07-000107	CA-CCO-000224	Site	Prehistoric, Protohistoric
P-07-000204	CA-CCO-000405/H	Site	Prehistoric, Protohistoric, Historic
P-07-000022	CA-CCO-000002	Site	Prehistoric, Unknown
P-07-000151	CA-CCO-000272	Site	Protohistoric
P-07-001776		Site	Protohistoric
P-07-000282	CA-CCO-000511	Other	Unknown
P-07-000549	CA-CCO-000061	Other	Unknown
P-07-000559	CA-CCO-000071	Other	Unknown
P-07-000575	CA-CCO-000087	Other	Unknown
P-07-000579	CA-CCO-000091	Other	Unknown
P-07-000589	CA-CCO-000101	Other	Unknown
P-07-000599	CA-CCO-000111	Other	Unknown
P-07-004476		Site	Unknown
P-07-004477		Site	Unknown

Source: NWIC 2018.

Appendix 5.5-2 Tribal Correspondence

Appendices

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NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone: (916) 373-3710
Website: http://www.nahc.ca.gov

January 8, 2019

Lily Arias
ICF

Sent by Email: lily.arias@icf.com

RE: Contra Costa County General Plan Update and EIR, Contra Costa County

Dear Ms. Arias:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. **The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area**. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. **By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe**. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: Sharaya.Souza@NAHC.ca.gov.

Sincerely,

Sharaya Souza
Analyst

Attachment

Native American Heritage Commission
Native American Contacts List
1/7/2019

Amah MutsunTribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
789 Canada Road — Ohlone/Costanoan
Woodside ,CA 94062
amahmutsuntribal@gmail.com
(650) 851-7489 Cell
(650) 332-1526 Fax

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28 — Ohlone/Costanoan
Hollister ,CA 95024
ams@indiancanyon.org
(831) 637-4238

Muwekma Ohlone Indian Tribe of the SF Bay Area
Charlene Nijmeh, Chairperson
20885 Redwood Road, Suite 232 — Ohlone / Costanoan
Castro Valley ,CA 94546
cnihmeh@muwekma.org
(408) 464-2892
(408) 205-9714

North Valley Yokuts Tribe
Katherine Erolinda Perez, Chairperson
P.O. Box 717 — Ohlone/Costanoan
Linden ,CA 95236 — Northern Valley Yokuts
canutes@verizon.net — Bay Miwok
(209) 887-3415

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3388 — Ohlone/Costanoan
Fremont ,CA 94539 — Bay Miwok
chochenyo@AOL.com — Plains Miwok
(510) 882-0527 Cell — Patwin
(510) 687-9393 Fax

Wilton Rancheria
Raymond Hitchcock, Chairperson
9728 Kent Street — Miwok
Elk Grove ,CA 95624
rhitchcock@wiltonrancheria-nsn.gov
(916) 683-6000 Office
(916) 683-6015 Fax

This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code,Section 5097.94 of the Public Resources Code, or Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American Tribes for the proposed:
Contra Costa County General Plan Update and EIR, Contra Costa County.

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Charlene Nijmeh, Chairperson
Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
20885 Redwood Road, suite 232
Castro Valley, CA 94546

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Nijmeh,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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Director

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Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
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Kara Douglas
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Kelli Zenn
Business Operations Manager

desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

Opportunity for Consultation

This letter and preliminary project information serve as a formal request for consultation as required under the Senate Bill 18 (SB 18) process for the project, as described in Government Code § 65352.3, and the Assembly Bill 52 (AB 52) process for the project, as described under CEQA PRC § 21080.3.1 and Chapter 532 Statutes of 2014.

The County invites you to communicate any concerns you might have regarding places within the project area that are important to your community. The County requests your participation in the identification and protection of cultural resources, sacred lands, or other heritage sites within unincorporated Contra Costa County with the understanding that you or other members of the community might possess specialized knowledge of the area.

In accordance with Government Code § 65352.3(a)(2), you are provided 90 days from receipt of this letter to either request or decline consultation for this project in writing. Please send your written response to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the project if we do not receive a response within the period provided by law.

If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Ann Marie Sayers, Chairperson
Indian Canyon Mutsun Band of Costanoan
PO Box 28
Hollister, CA 95024

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Sayers,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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Business Operations Manager

desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

Opportunity for Consultation

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Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the project if we do not receive a response within the period provided by law.

If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Irenne Zwierlein, Chairperson
Amah Mutsun Tribal Band of Mission San Juan Bautista
789 Canada
Woodside, CA 94062

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Zwierlein,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

Opportunity for Consultation

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You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the project if we do not receive a response within the period provided by law.

If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Katherine Erolinda Perez, Chairperson
North Valley Yokuts Tribe
PO Box 717
Linden, CA 95236

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Perez,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

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desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

Opportunity for Consultation

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Martinez, CA 94553

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If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Andrew Galvan
The Ohlone Indian Tribe
PO Box 3388
Fremont, CA 94539

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Galvan

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

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Assistant Deputy Director

Kelli Zenn
Business Operations Manager

desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

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30 Muir Road
Martinez, CA 94553

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If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Lloyd Mathiesen, Chairperson
Chicken Ranch Rancheria of Me-Wuk Indians
PO Box 1159
Jamestown, CA 95327

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Mathiesen,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

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Business Operations Manager

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Opportunity for Consultation

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30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the project if we do not receive a response within the period provided by law.

If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Daniel Gomez, Chairperson
Cachil Dehe Band of Wintun Indians of the Colusa Indian Community
3730 Highway 45
Colusa, CA 95932

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Gomez,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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Director

Aruna Bhat
Deputy Director

Jason Crapo
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Assistant Deputy Director

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Business Operations Manager

desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

Opportunity for Consultation

This letter and preliminary project information serve as a formal request for consultation as required under the Senate Bill 18 (SB 18) process for the project, as described in Government Code § 65352.3, and the Assembly Bill 52 (AB 52) process for the project, as described under CEQA PRC § 21080.3.1 and Chapter 532 Statutes of 2014.

The County invites you to communicate any concerns you might have regarding places within the project area that are important to your community. The County requests your participation in the identification and protection of cultural resources, sacred lands, or other heritage sites within unincorporated Contra Costa County with the understanding that you or other members of the community might possess specialized knowledge of the area.

In accordance with Government Code § 65352.3(a)(2), you are provided 90 days from receipt of this letter to either request or decline consultation for this project in writing. Please send your written response to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the project if we do not receive a response within the period provided by law.

If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Merlene Sanchez, Chairperson
Guidiville Indian Rancheria
PO Box 339
Talmage, CA 95481

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Sanchez,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

A search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was requested on December 20, 2018, with updates requested in October 2019 and October 2020. The SLF search identified Native American cultural resources within unincorporated Contra Costa County. The NAHC also provided your name as a representative of a California Native American Tribe who may have knowledge of cultural resources within or near the project area.

Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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desired through 2040, based on community feedback. Along with updating the General Plan, the County will also implement a comprehensive update to both the County Zoning Code and the CAP. These new plans and regulations will guide development in unincorporated Contra Costa County through 2040. The County is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report for this project.

Opportunity for Consultation

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If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Kanyon Sayers, MLD Contact
Indian Canyon Mutsun Band of Costanoan
1615 Pearson Court
San Jose, CA 95122

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Kanyon Sayers, MLD Contact

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
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Contra Costa County

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Kelli Zenn
Business Operations Manager

January 15, 2021

Monica Arellano
Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
20885 Redwood Road, suite 232
Castro Valley, CA 94546

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Arellano

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

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Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
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Contra Costa County

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Director

Aruna Bhat
Deputy Director

Jason Crapo
Deputy Director

Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Timothy Perez, MLD Contact
North Valley Yokuts Tribe
PO Box 717
Linden, CA 95236

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Perez,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

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Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

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Martinez, CA 94553
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Contra Costa County

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Director

Aruna Bhat
Deputy Director

Jason Crapo
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Maureen Toms
Deputy Director

Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Steven Hutchason, THPO
Wilton Rancheria
9728 Kent Street
Elk Grove, CA 95624

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Hutchason,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

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If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553
Phone:1-855-323-2626

Contra Costa County

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Director

Aruna Bhat
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Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Jesus Tarango, Chairperson
Wilton Rancheria
9728 Kent Street
Elk Grove, CA 95624

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Tarango,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

The County is in the process of updating its General Plan, Zoning Code, and Climate Action Plan (CAP). The General Plan Update will add new and expanded policy topics to address the current requirements of State law, modernize the County's policy framework, and address land use mapping issues and inconsistencies. The General Plan Update will also consider potential land use changes in unincorporated communities where change or enhancement of existing uses is

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Respectfully,

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Principal Planner

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Contra Costa County

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Kelli Zenn
Business Operations Manager

January 15, 2021

Dahlton Brown, Director of Administration
Wilton Rancheria
9728 Kent Street
Elk Grove, CA 95624

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Mr. Brown,

In accordance with the California Public Resources Code (PRC), Contra Costa County (County) is providing notice of a proposed project within your jurisdiction. We are hereby notifying you of an opportunity to request consultation with us regarding the potential for this project to impact tribal cultural resources, as defined under PRC § 21074.

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Proposed Project

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Contra Costa County

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Amalia Cunningham
Assistant Deputy Director

Kelli Zenn
Business Operations Manager

January 15, 2021

Corrina Gould, Chairperson
The Confederated Villages of Lisjan
10928 Edes Avenue
Oakland, CA 94603

RE: Notice of Opportunity to Request Consultation under Senate Bill 18 and Assembly Bill 52 for the Proposed Contra Costa County General Plan Update, Zoning Code Update, and Climate Action Plan Update (aka Envision Contra Costa 2040)

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Ms. Gould,

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Opportunity for Consultation

This letter and preliminary project information serve as a formal request for consultation as required under the Senate Bill 18 (SB 18) process for the project, as described in Government Code § 65352.3, and the Assembly Bill 52 (AB 52) process for the project, as described under CEQA PRC § 21080.3.1 and Chapter 532 Statutes of 2014.

The County invites you to communicate any concerns you might have regarding places within the project area that are important to your community. The County requests your participation in the identification and protection of cultural resources, sacred lands, or other heritage sites within unincorporated Contra Costa County with the understanding that you or other members of the community might possess specialized knowledge of the area.

In accordance with Government Code § 65352.3(a)(2), you are provided 90 days from receipt of this letter to either request or decline consultation for this project in writing. Please send your written response to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the project if we do not receive a response within the period provided by law.

If you have any questions, please do not hesitate to call me at (925) 674-7791. Thank you and we look forward to your response.

Respectfully,

Will Nelson
Principal Planner

From:	Will Nelson
To:	Tanya Sundberg
Subject:	FW: General Plan SB18/AB52
Date:	Wednesday, March 10, 2021 4:55:09 PM

From: Corrina Gould <cvltribe@gmail.com>
Sent: Wednesday, March 10, 2021 3:23 PM
To: Will Nelson <Will.Nelson@dcd.cccounty.us>
Subject: General Plan SB18/AB52

Hello,

The Tribe would like to consult with the county on the General Plan for Contra Costa County. We look forward to hearing from you. Thank you.

'Uni (Respectfully),
Corrina Gould, Tribal Chair
Confederated Villages of Lisjan Tribe

From:	Corrina Gould
To:	Will Nelson
Cc:	tsundberg@placeworks.com; Pappas, Steve
Subject:	Re: FW: Contra Costa Comments
Date:	Wednesday, December 1, 2021 10:30:37 AM
Attachments:	image002.png

Dear Will and All,

I am so sorry for the last minute cancellation. We would like more time to go over this document again with our legal team. Can we please reschedule?

'Uni (Respectfully),

Corrina Gould, Tribal Chair
Confederated Villages of Lisjan Tribe

On Tue, Nov 30, 2021 at 4:33 PM Will Nelson <Will.Nelson@dcd.cccounty.us> wrote:

> Hello Corrina,
>
> I hope you're well.
>
> We have reviewed the Tribe's comments and provided our thoughts as notes in the attachment. The references in the notes correspond to the draft policy language I sent on November 3. Please also see the comment in the email below regarding policy COS-P.9.7. We're looking forward to discussing each of these items tomorrow.
>
> Best,
>
> Will
>
> **William R. Nelson**
>
> Principal Planner
>
> Contra Costa County

Department of Conservation and Development

30 Muir Road, Martinez, CA 94553

Phone (925) 655-2898

Web www.contracosta.ca.gov

****PLEASE NOTE, THE DEPARTMENT HAS NEW PHONE NUMBERS AS OF APRIL 1.**

MY NEW PHONE NUMBER IS 925-655-2898.**

We're planning for the future of Contra Costa County.

Learn more and get involved at envisioncontracosta2040.org.



This message was sent from a public e-mail system and may be subject to disclosure under the California Public Records Act.

From: Tanya Sundberg <tsundberg@placeworks.com>

Sent: Tuesday, November 23, 2021 7:30 PM
To: Will Nelson <Will.Nelson@dcd.cccounty.us>; Pappas, Steve <steve.pappas@icf.com>
Cc: jjansen@placeworks.com; Lindsey Klein <lklein@placeworks.com>
Subject: RE: Contra Costa Comments

Hi Will,

As we discussed last week, we have provided responses in the attached PDF.

In addition to the comments in the PDF, the cover letter makes a point that the Confederated Villages of Lisjan are a living culture. The Sogorea Te' Land Trust website also uses language about the Tribe's resiliency. We will make this point in the background text, but we would like to find a way to also reference it in the policies and/or actions. Here is one idea:

COS-P9.7 "Work with local Native American tribes to protect recorded and unrecorded cultural and sacred sites and to educate developers and the community at large about living Native American culture ~~history~~ in the region as well as the history of Native Americans in what is now Contra Costa County."

I hope you all had fun at Alec's birthday party last weekend, and that you are looking forward to a relaxing and delicious Thanksgiving!

Tanya

TANYA SUNDBERG

Associate Principal

she/her

510.848.3815 ext. 3390 | cell: 510.866.8336

From: Will Nelson <Will.Nelson@dcd.cccounty.us>
Sent: Tuesday, November 16, 2021 2:42 PM
To: Tanya Sundberg <tsundberg@placeworks.com>; Pappas, Steve <steve.pappas@icf.com>
Cc: Joanna Jansen <jjansen@placeworks.com>; Lindsey Klein <lklein@placeworks.com>

Subject: FW: Contra Costa Comments

Tanya and Steve,

Please see the attached comments from Corrina and the Lisjan tribe. These comments have also been forwarded to the Historical Landmarks Advisory Committee members for consideration at Thursday's meeting. I think there are a lot of good suggestions here. We should be prepared to discuss these at our next meeting with the tribe.

Thanks,

Will

William R. Nelson

Principal Planner

Contra Costa County

Department of Conservation and Development

30 Muir Road, Martinez, CA 94553

Phone (925) 655-2898

Web www.contracosta.ca.gov

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This message was sent from a public e-mail system and may be subject to disclosure under the California Public Records Act.

From: Corrina Gould <cvltribe@gmail.com>
Sent: Tuesday, November 16, 2021 1:53 PM
To: Will Nelson <Will.Nelson@dcd.cccounty.us>
Subject: Contra Costa Comments

Hello,

Please see attached documents for Tribal comments for Contra Costa.

'Uni (Respectfully),

Corrina Gould, Tribal Chair

Confederated Villages of Lisjan Tribe

From:	Will Nelson
To:	Corrina Gould
Cc:	Tanya Sundberg
Subject:	Updated Cultural Resources Goals, Policies, and Actions for Envision Contra Costa 2040
Date:	Thursday, February 10, 2022 5:49:02 PM
Attachments:	image001.jpg image002.png CulturalResourcesGoalsPoliciesActions_Revised_Feb2022.pdf CulturalResourcesGoalsPoliciesActions_Revised_Feb2022_Clean.docx

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Hello Corrina,

I hope you're well.

Thank you again for sharing your time and knowledge with us during our Envision Contra Costa 2040 consultation meeting last December. We have prepared draft updates to the cultural resources policy guidance that respond to the Tribe's comments and our December discussion, and attached it for your review. Changes since the previous version are tracked in the attached PDF. The changes have all been accepted in the attached Word file, which I've included to make it easier for you to suggest additional changes/edits.

As part of this update, we consulted with other County staff to consider the Tribe's requests. While we aren't able to achieve all of the Tribe's suggestions, the majority of those suggestions are incorporated into the revised policy guidance, including:

- Adding a new goal specific to tribal consultation and protecting tribal cultural resources.
- Strengthening and expanding the policy language about consulting with tribes.
- Adding new policy guidance about facilitating tribal acquisition of conservation easements and tribal access to open space and recreation lands.
- Adding new policy guidance about avoidance and mitigation of impacts to tribal cultural resources.
- Adding new policy guidance about informing developers about Native American culture and tribal cultural resources.
- Adding new policy guidance about relinquishing found tribal cultural artifacts to tribes.

Once you've reviewed the revised policy guidance, please reach out to suggest times for our next discussion.

Looking forward to hearing from you.

Best,

Will

William R. Nelson
Principal Planner
Contra Costa County
Department of Conservation and Development
30 Muir Road, Martinez, CA 94553
Phone (925) 655-2898
Web www.contracosta.ca.gov

****PLEASE NOTE, THE DEPARTMENT HAS NEW PHONE NUMBERS AS OF APRIL 1.**
MY NEW PHONE NUMBER IS 925-655-2898.**

We're planning for the future of Contra Costa County.
Learn more and get involved at envisioncontracosta2040.org.

Confederated Villages of Lisjan Nation
(510) 575-8408 ♦ 10926 Edes Avenue, Oakland CA 94603

September 1, 2022

RE: California Environmental Quality Act Public Resources Code section 21080.3, subd. (b) Request for Formal Notification of Proposed Projects Within the Tribe's Geographic Area of Traditional and Cultural Affiliation

Greetings,

As of the date of this letter, in accordance with Public Resources Code Section 21080.3.1, subd. (b), Confederated Villages of Lisjan Nation, which is traditionally and culturally affiliated with a geographic area within your agency's geographic area of jurisdiction, requests formal notice of and information on proposed projects for which your agency will serve as a lead agency under the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq.

Pursuant to Public Resources Code section 21080.3.1, subd. (b), and until further notice, we hereby designate the following person as the tribe's lead contact person for purposes of receiving notices of proposed projects from your agency:

Corrina Gould, Tribal Chair

10926 Edes Ave, Oakland, CA 94603

510-575-8408

cvltribe@gmail.com

We request that all notices be sent via certified U.S. Mail with a return receipt. Following receipt and review of the information your agency provides, within the 30-day period proscribed by Public Resources Code section 21080.3.1, subd. (d), the Confederated Villages of Lisjan Nation may request consultation, as defined by Public Resources Code section 21080.3.1, subd. (b), pursuant to

Confederated Villages of Lisjan Nation
(510) 575-8408 ♦ 10926 Edes Avenue, Oakland CA 94603

Public Resources Code section 21080.3.2 to mitigate any project impacts a specific project may cause to tribal cultural resources.

If you have any questions or need additional information, please contact our lead contact person listed above.

Sincerely,

/s/ Corrina Gould

Corrina Gould

Tribal Chair, Confederated Villages of Lisjan Nation

CC:Native American Heritage Commission

Confederated Villages of Lisjan
(510) 575-8408 ♦ 10926 Edes Avenue, Oakland CA 94603

In the Introduction section on page 9-9 and throughout the Document we are referred to as “Costanoan.” This is a term applied to us by Spanish colonizers rather than a word we use for ourselves. We collectively refer to our related nations as “Ohlone”, and we specifically are the Lisjan Ohlone. The Confederated Villages of Lisjan are one of many Ohlone nations, and each nation is unique in its culture and language. The Confederated Villages of Lisjan are made up of the six nations that were directly enslaved at Mission San Jose in Fremont, CA and Mission Dolores in San Francisco, CA: Lisjan (Ohlone), Karkin (Ohlone), Bay Miwok, Plains Miwok, Delta Yokut and Napian (Patwin). Our territory includes 5 Bay Area counties; Alameda, Contra Costa, Solano, Napa and San Joaquin, and we are directly tied to the “Indian Town” census of the 1920’s and the Verona Band.

Stating that “no sites have been identified” demonstrating historic sites in the Bay Area from 5,000 years ago is inaccurate. Overall the historic description is lacking in accuracy. We would like to draft a more accurate version, if possible.

Page 9-10 States that “A systematic archaeological survey has not been conducted for Contra Costa County” and that site information is mostly from “sporadic surveys.” Can we partner with the County to ensure that changes? Determining what needs to be protected and which cultural resources are connected to what specific Indigenous nation requires thorough and systematic research. The County should partner with Tribes on this to ensure confidentiality and assist in locating sites for protection. The document does not seem to indicate the surveys took place in partnership with Tribes, so it is likely that a lot of information is missing.

We suggest you review the historic maps from the Mexican Rancho period to determine possible sensitive sites requiring protection.

In determining the “sensitivity” of sites described on page 9-10, was there any tribal input? Tribes are in the best position to determine the sensitivity and meaning of their homelands. We would like to be part of determining the level of protection our historic and sacred sites warrant.

Page 9-12 states that “Both public and private stewardship of the resources on-site shall be considered as long as the protection is long-term and guaranteed in some manner” and that the
East Bay Regional Park District (EBRPD) and Contra Costa Water District (CCWD) will work to acquire lands for protection. We would like to partner in the acquisition and protection of lands that are determined to be part of our historic homelands.

Page 9-12 notes that there was a historic resource inventory compiled in 1976, and it is not considered a comprehensive list. Has this information been updated, or is the County still working with the list from the 70's? As it is admittedly not comprehensive and the 70s was a time where many still refused to consult with or respect tribes, we would like to ensure a new and more thorough list is compiled. We would like information regarding our resources to remain confidential in such a list.

Page 9-12 notes that "efforts" should be made to secure financing for studies. Does the County have a concrete plan for obtaining the funding? We would like to see the County develop a full and funded plan before making any major decisions regarding our historic and cultural resources.

9-28 states that areas with significant and important archaeological or historic significance can be publicly owned. We would prefer to have ownership over our own sacred and historic sites. To the extent possible, we ask for such sites to be acquired for us. It would save the County financially as we could work to preserve and revitalize the natural or cultural elements of the site. If this is not possible, we ask for a partnership where we are allowed access and use of our sites for ceremonial and preservation purposes. We would also like a clearer route for obtaining conservation easements for tribal cultural uses. Per SB 18, California Native American Tribes are entities that can obtain such easements. We ask that especially sacred or sensitive sites be kept off limits from the general public. Please consider that what is merely a place for recreational pastime for some is an ancient site of great cultural and spiritual importance for us.
9-30 states that "development surrounding areas of historic significance" shall have a design that "enhances the historic quality" of the area. We ask that to the extent possible no development occur surrounding our sacred and historic sites. They are already as they should be and no development will enhance their quality.

Where the "Development Review Process" is discussed on page 9-13, we would like language indicating Tribes will be consulted with as part of the review process.

We want to make sure that Tribes are properly consulted on any project that will effect us.

We would like "collaborating with Tribes" to be included in the Historic and Cultural Resources Goals. It is important to set this as a guideline.

9-k states Ordinances will be reviewed and amended as necessary to make amendments necessary for safeguarding resources. We would like to partner with you in the review and suggested amendments of such ordinances.

9-o describes a program of seeking coordination and cooperation of federal, State and local governments to develop funding, acquire sites, and develop easements. Please include Tribes in this program.

In general, the “other program” section on page 9-13 can include a program of working with tribes to preserve lands, develop better educational materials for the public, grant easements and other partnerships.

Please be aware that for us, a cultural resource may be less tangible than merely an object or the site itself. In our culture, views of and access to our sacred sites are often as important as the area itself. We ask that you defer to our traditions and own cultural understanding when discussing the importance of and use of our historic and cultural resources.

SAMPLE LANGUAGE

In addition to these suggested changes to specific parts of the current General Plan, we have sample language regarding specific policy to address cultural resources and other issues.

CULTURAL AND ARCHAEOLOGICAL RESOURCES GOAL

Protection and Preservation of Native American Cultural Places. Policies

1. Consult with culturally affiliated Native American tribes prior to amending the General Plan and adopting or amending specific plans, and when a tribal cultural site is to be placed in permanent open space, consistent with state law.

2. Work with culturally affiliated tribes to identify and appropriately address cultural resources and tribal sacred sites through the development review process.

3. Avoid or mitigate to the maximum feasible extent impacts of development on Native American archaeological and cultural resources.

4. Encourage voluntary landowner efforts to protect cultural resources and tribal cultural sites consistent with state law.

Implementation Measures

1. The County shall refer proposals for projects that are not categorically exempted from the California Environmental Quality Act for evaluation and a recommendation as to whether further study is required to determine the presence or absence of archaeological resources. If further study is required, the project applicant shall contract with a qualified professional to conduct the study and make recommendations designed to avoid or minimize adverse impacts on cultural or historic resources and indicate whether further investigation is needed. All studies shall be completed and submitted to the County prior to the completion of any environmental document for the project.

2. The County will refer draft environmental documents, including any studies and recommended mitigation measures, to the appropriate Native American tribes for review and comment as part of the public review process for such documents. Mitigation

measures to avoid or minimize impacts on Native American cultural resources may include the execution of a cultural resources treatment agreement between the developer and the appropriate tribe(s) that address the treatment and disposition of cultural resources and human remains, and tribal monitoring during earth-disturbing activities.

3. Consult with culturally affiliated tribes prior to designating open space in order to protect the identity of any cultural places that exist on the proposed open space and develop a treatment plan and management plan for any such cultural places.

4. Work with culturally affiliated tribes to acquire and hold conservation easements on terms mutually satisfactory to the tribe and landowner for purposes of protecting tribal cultural places.

Archaeological and Cultural Resources

1. Any project that involves earth disturbing activities within previously undisturbed soils in an area determined to be archaeologically or culturally sensitive, shall require evaluation of the site by a qualified archaeologist retained by the project applicant. The applicant shall implement the recommendations of the archaeologist, subject to the approval of the County Planning Department.

2. Any project that involves earth disturbing activities in previously undisturbed soils that have been determined to be archaeologically or culturally sensitive shall require consultation by the applicant with California Indian Tribe(s) which have a traditional cultural affiliation with the project area and/or the resources affected by the project, for the purposes of determining archaeological and cultural resources impacts and creating appropriate mitigation to address such impacts. The applicant shall also arrange for monitoring of earth disturbing activities by Tribe(s) which have a traditional cultural affiliation with the project area and/or the resources affected by the project, if requested.

Human Remains

1. In the event of the discovery of a burial, human bone or suspected human bone all excavation or grading in the vicinity of the find shall halt immediately and the area of the find shall be protected and the project applicant immediately shall notify the County Coroner of the find and comply with the provisions of Cal. Health and Safety Code Section 7050.5, including Cal. Public Resources Code Section 5097.98, if applicable.

2. In the event that human remains are determined to be Native American human remains the applicant shall consult with the MLD to determine appropriate treatment for the Native American human remains as prescribed in Public Resources Code Section 5097 et seq..

Protection and Preservation of Native American Cultural Places. Policies

1. Consult with culturally affiliated Native American tribes prior to amending the General Plan and adopting or amending specific plans, and when a tribal cultural site is to be placed in permanent open space, consistent with state law.

2. Work with culturally affiliated tribes to identify and appropriately address cultural resources and tribal sacred sites through the development review process.

3. Avoid or mitigate to the maximum feasible extent impacts of development on Native American archaeological and cultural resources.

4. Encourage voluntary landowner efforts to protect cultural resources and tribal cultural sites consistent with state law.

Sample Cultural Resources Mitigation Measures

1. Prior to the issuance of grading permits, the developer is required to enter into a cultural resources' treatment agreement with the culturally affiliated tribe. This agreement will address the treatment and disposition of cultural resources and human remains that may be impacted as a result of the development of the Project, as well as provisions for tribal monitors.

2. If cultural resources are discovered during the project construction, all work in the area of the find shall cease, and a qualified archaeologist and representatives of the culturally affiliated tribe shall be retained by the project sponsor to investigate the find and make recommendations as to treatment and mitigation.

3. A qualified archaeological monitor will be present and will have the authority to stop and redirect grading activities, in consultation with the culturally affiliated tribe and their designated monitors, to evaluate the significance of any archaeological resources discovered on the property.

4. Tribal monitors from the culturally affiliated tribe shall be allowed to monitor all grading, excavation and groundbreaking activities, including all archaeological surveys, testing, and studies, to be compensated by the developer.

5. The landowner agrees to relinquish ownership of all cultural resources, including all archaeological artifacts that are found on the Project area, to the culturally affiliated tribe for proper treatment and disposition.

6. All cultural sites within the Project area are to be avoided and preserved.

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Kanyon Sayers-Roods, MLD,

This letter serves as a formal invitation to the Indian Canyon Mutsun Band of Costanoan (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
- Public Facilities and Services Element
- Health and Safety Element
- Growth Management Element

All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

project, and final development approval decisions are made on a project-by-project basis by County staff, review boards, the Planning Commission, and/or the Board of Supervisors.

The proposed CAP is a separate document that provides strategic implementation programs to show how the County will reduce GHG emissions in support of the State's adopted GHG reduction targets. The CAP implements the General Plan and its general policies and actions supporting the reduction of GHG emissions. As an implementing document, the CAP provides more specific direction to the County than the General Plan, and the CAP will be monitored and updated more often than the General Plan.

Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

As of the date of preparation of this letter, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Opportunity to Submit Information

As part of the cultural resources review of the Contra Costa County 2045 General Plan and the CAP Updates under CEQA, we are providing this notification as an opportunity for the Tribe to submit any information the Tribe is willing to share about cultural resources, including Tribal cultural resources as defined in PRC § 21074 that may be near the EIR Study Area (see Figure 2, *EIR Study Boundaries*). We understand that the locations of these resources are sensitive and resource locations would not be disclosed in public documents and will be kept confidential as provided for under California Government Code § 6254.10.

If the Tribe wishes to engage in formal government-to-government consultation with Contra Costa County for the Contra Costa County 2045 General Plan and the CAP Updates under AB 52 and PRC § 21080.3.1, please respond in writing within 30 calendar days of this notice **(by Monday, November 6, 2023)** with the Tribe's designated Point of Contact for consultation to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the Contra Costa County 2045 General Plan and the CAP Updates if we do not receive a response within the period provided by law. This notification does not limit the ability of the Tribe to submit information to Contra Costa County.

If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairman Daniel Gomez,

This letter serves as a formal invitation to the Cachil Dehe Band of Wintun Indians of the Colusa Indian Community (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

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The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
- Public Facilities and Services Element
- Health and Safety Element
- Growth Management Element

All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

project, and final development approval decisions are made on a project-by-project basis by County staff, review boards, the Planning Commission, and/or the Board of Supervisors.

The proposed CAP is a separate document that provides strategic implementation programs to show how the County will reduce GHG emissions in support of the State's adopted GHG reduction targets. The CAP implements the General Plan and its general policies and actions supporting the reduction of GHG emissions. As an implementing document, the CAP provides more specific direction to the County than the General Plan, and the CAP will be monitored and updated more often than the General Plan.

Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

As of the date of preparation of this letter, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Opportunity to Submit Information

As part of the cultural resources review of the Contra Costa County 2045 General Plan and the CAP Updates under CEQA, we are providing this notification as an opportunity for the Tribe to submit any information the Tribe is willing to share about cultural resources, including Tribal cultural resources as defined in PRC § 21074 that may be near the EIR Study Area (see Figure 2, *EIR Study Boundaries*). We understand that the locations of these resources are sensitive and resource locations would not be disclosed in public documents and will be kept confidential as provided for under California Government Code § 6254.10.

If the Tribe wishes to engage in formal government-to-government consultation with Contra Costa County for the Contra Costa County 2045 General Plan and the CAP Updates under AB 52 and PRC § 21080.3.1, please respond in writing within 30 calendar days of this notice **(by Monday, November 6, 2023)** with the Tribe's designated Point of Contact for consultation to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the Contra Costa County 2045 General Plan and the CAP Updates if we do not receive a response within the period provided by law. This notification does not limit the ability of the Tribe to submit information to Contra Costa County.

If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Lloyd Mathiesen,

This letter serves as a formal invitation to the Chicken Ranch Rancheria of Me-Wuk Indians (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
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- Health and Safety Element
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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Opportunity to Submit Information

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If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Donald Duncan,

This letter serves as a formal invitation to the Guidiville Indian Rancheria (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
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All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Opportunity to Submit Information

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If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Ann Marie Sayers,

This letter serves as a formal invitation to the Indian Canyon Mutsun Band of Costanoan (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

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The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

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The proposed General Plan encompasses the required and optional topics within the following chapters:

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Opportunity to Submit Information

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Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
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Jason Crapo
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Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Cosme Valdez,

This letter serves as a formal invitation to the Nashville Enterprise Miwok-Maidu-Nishinam Tribe (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

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The proposed CAP is a separate document that provides strategic implementation programs to show how the County will reduce GHG emissions in support of the State's adopted GHG reduction targets. The CAP implements the General Plan and its general policies and actions supporting the reduction of GHG emissions. As an implementing document, the CAP provides more specific direction to the County than the General Plan, and the CAP will be monitored and updated more often than the General Plan.

Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

As of the date of preparation of this letter, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Opportunity to Submit Information

As part of the cultural resources review of the Contra Costa County 2045 General Plan and the CAP Updates under CEQA, we are providing this notification as an opportunity for the Tribe to submit any information the Tribe is willing to share about cultural resources, including Tribal cultural resources as defined in PRC § 21074 that may be near the EIR Study Area (see Figure 2, *EIR Study Boundaries*). We understand that the locations of these resources are sensitive and resource locations would not be disclosed in public documents and will be kept confidential as provided for under California Government Code § 6254.10.

If the Tribe wishes to engage in formal government-to-government consultation with Contra Costa County for the Contra Costa County 2045 General Plan and the CAP Updates under AB 52 and PRC § 21080.3.1, please respond in writing within 30 calendar days of this notice **(by Monday, November 6, 2023)** with the Tribe's designated Point of Contact for consultation to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the Contra Costa County 2045 General Plan and the CAP Updates if we do not receive a response within the period provided by law. This notification does not limit the ability of the Tribe to submit information to Contra Costa County.

If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Timothy Perez,

This letter serves as a formal invitation to the North Valley Yokuts Tribe (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
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Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Opportunity to Submit Information

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Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Kanyon Sayers-Roods, MLD,

This letter serves as a formal invitation to the Indian Canyon Mutsun Band of Costanoan (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

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The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
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All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
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Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Charlene Nijmeh,

This letter serves as a formal invitation to the Muwekma Ohlone Indian Tribe of the San Francisco Bay Area (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

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The proposed General Plan encompasses the required and optional topics within the following chapters:

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Principal Planner
Contra Costa County

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Contra Costa County

John Kopchik
Director

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October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Vice Chairwoman Monica Arellano,

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If the Tribe wishes to engage in formal government-to-government consultation with Contra Costa County for the Contra Costa County 2045 General Plan and the CAP Updates under AB 52 and PRC § 21080.3.1, please respond in writing within 30 calendar days of this notice **(by Monday, November 6, 2023)** with the Tribe's designated Point of Contact for consultation to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the Contra Costa County 2045 General Plan and the CAP Updates if we do not receive a response within the period provided by law. This notification does not limit the ability of the Tribe to submit information to Contra Costa County.

If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
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- Growth Management Element

All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

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Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Andrew Galvan,

This letter serves as a formal invitation to The Ohlone Indian Tribe (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

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October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Jesus Tarango,

This letter serves as a formal invitation to the Wilton Rancheria (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

As of the date of preparation of this letter, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Opportunity to Submit Information

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If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
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October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Katherine Perez,

This letter serves as a formal invitation to the North Valley Yokuts Tribe (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

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The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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Contra Costa County

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Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Corrina Gould,

This letter serves as a formal invitation to The Confederated Villages of Lisjan (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

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October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

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- Stronger Communities Element
- Land Use Element
- Transportation Element
- Housing Element (prepared as part of a separate project)
- Conservation, Open Space, and Working Lands Element
- Public Facilities and Services Element
- Health and Safety Element
- Growth Management Element

All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

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The proposed CAP is a separate document that provides strategic implementation programs to show how the County will reduce GHG emissions in support of the State's adopted GHG reduction targets. The CAP implements the General Plan and its general policies and actions supporting the reduction of GHG emissions. As an implementing document, the CAP provides more specific direction to the County than the General Plan, and the CAP will be monitored and updated more often than the General Plan.

Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

As of the date of preparation of this letter, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Opportunity to Submit Information

As part of the cultural resources review of the Contra Costa County 2045 General Plan and the CAP Updates under CEQA, we are providing this notification as an opportunity for the Tribe to submit any information the Tribe is willing to share about cultural resources, including Tribal cultural resources as defined in PRC § 21074 that may be near the EIR Study Area (see Figure 2, *EIR Study Boundaries*). We understand that the locations of these resources are sensitive and resource locations would not be disclosed in public documents and will be kept confidential as provided for under California Government Code § 6254.10.

If the Tribe wishes to engage in formal government-to-government consultation with Contra Costa County for the Contra Costa County 2045 General Plan and the CAP Updates under AB 52 and PRC § 21080.3.1, please respond in writing within 30 calendar days of this notice **(by Monday, November 6, 2023)** with the Tribe's designated Point of Contact for consultation to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the Contra Costa County 2045 General Plan and the CAP Updates if we do not receive a response within the period provided by law. This notification does not limit the ability of the Tribe to submit information to Contra Costa County.

If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries

Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Neil Peyron,

This letter serves as a formal invitation to the Tule River Indian Tribe (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Opportunity to Submit Information

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Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Chairperson Kenneth Woodrow,

This letter serves as a formal invitation to the Wuksache Indian Tribe/Eshom Valley Band (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

The Contra Costa County 2045 General Plan outlines a project area that excludes land within incorporated municipalities' limits (i.e., its authority is limited to the unincorporated areas within the county). In addition, Measure C-1990 established the 65/35 Land Preservation Standard and Urban Limit Line (ULL). The 65/35 Land Preservation Standard restricts urban development to no more than 35 percent of the county's land area, while the remaining 65 percent must be preserved for agriculture, open space, parks, and other non-urban uses. The ULL limits the areas where urban development can occur. The EIR will examine potential impacts on lands within unincorporated Contra Costa County, including land within and outside the ULL and within each municipality's sphere of influence (SOI), which is referred to as the "EIR Study Area" (see Figure 2, *EIR Study Boundaries*).

The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

Finally, the project includes an update to the County's 2015 CAP. The CAP will be a separate document that sets targets and establishes measures to reduce GHG emissions in unincorporated Contra Costa County, consistent with State targets.

The proposed General Plan encompasses the required and optional topics within the following chapters:

- Stronger Communities Element
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All specific plans and zoning in the county must be consistent with the General Plan. Similarly, all land use development approvals and environmental decisions made by the County must be consistent with the General Plan. The General Plan itself, however, does not approve or entitle any development project. Property owners have control over when they wish to propose a

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Records Search Results

Environmental review for the County's existing General Plan included a records search from the California Historical Resources Information System (CHRIS) Northwest Information Center (NWIC). The record search identified approximately 600 archaeological sites within the county. An additional 155 archaeological sites were identified as a result of a records search conducted in December 2018 at the NWIC. The 2018 records search was limited to sites documented in the county since 2005 to capture those that were formally documented since publication of the most recently reconsolidated General Plan in 2005–2020. A total of 755 archaeological sites were identified in the county, including 274 historic-era sites; 418 prehistoric sites; 54 multi-component sites, which have both historic-era and prehistoric components; and nine sites of unknown age. The records search also identified 380 built historical resources in the unincorporated areas of the county.

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Opportunity to Submit Information

As part of the cultural resources review of the Contra Costa County 2045 General Plan and the CAP Updates under CEQA, we are providing this notification as an opportunity for the Tribe to submit any information the Tribe is willing to share about cultural resources, including Tribal cultural resources as defined in PRC § 21074 that may be near the EIR Study Area (see Figure 2, *EIR Study Boundaries*). We understand that the locations of these resources are sensitive and resource locations would not be disclosed in public documents and will be kept confidential as provided for under California Government Code § 6254.10.

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If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

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Department of Conservation and Development

30 Muir Road
Martinez, CA 94553

Phone:1-855-323-2626

Contra Costa County

John Kopchik
Director

Maureen Toms
Deputy Director

Ruben Hernandez
Deputy Director

Jason Crapo
Deputy Director

Gabriel Lemus
Assistant Deputy Director

October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Dahlton Brown, Director of Administration,

This letter serves as a formal invitation to the Wilton Rancheria (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

Contra Costa County 2045 General Plan and CAP Updates

Contra Costa County is located in the San Francisco Bay Area in Northern California. It is bordered by San Francisco Bay to the west, San Pablo Bay and Suisun Bay to the north, Alameda County to the south, and San Joaquin County to the east (see Figure 1, *Regional Location*). Major interstates and State routes include Interstate 80, Interstate 580, Interstate 680, Highway 4, Highway 24, and Highway 242.

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The County is preparing comprehensive updates to its existing General Plan and CAP. The updates will establish County land use policy through 2045 and reduce greenhouse gas (GHG) emissions and enhance community resiliency.

State law requires that the General Plan contain seven elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. Environmental justice must also be addressed, either in its own element or throughout the General Plan (the County has taken a hybrid approach). The content of the elements is outlined in State law. The updated General Plan will include all State-required elements and two optional elements, Growth Management and Public Facilities and Services. The Housing Element is being updated in parallel to the rest of the General Plan. The updated Housing Element was adopted by the County Board of Supervisors on June 13, 2023, and is undergoing revision following a review by the California Department of Housing and Community Development.

The County's existing General Plan was adopted in 1991, with minor revisions occurring in 2005. The overall purpose of the General Plan Update is to create a modern General Plan that articulates a vision for the county's long-term physical form and development, while preserving and enhancing the quality of life for the County's residents. The key components of this project include broad community goals for the future of the County and specific policies and implementing actions that help achieve the goals. The updated General Plan will modernize the County's policy framework to address the current requirements of State law, with emphasis on the topics of environmental justice, economic development, community health, and sustainability. The General Plan Update will also include numerous land use changes in unincorporated communities where change or enhancement of existing uses is desired through 2045.

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Opportunity to Submit Information

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Principal Planner
Contra Costa County

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Contra Costa County

John Kopchik
Director

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Gabriel Lemus
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October 5, 2023

RE: Assembly Bill 52 Notification for the Contra Costa County 2045 General Plan and Climate Action Plan Updates, California

Project Location/Area: All of Unincorporated Contra Costa County

County File Number: GP18-0001

Steven Hutchason, THPO,

This letter serves as a formal invitation to the Wilton Rancheria (Tribe) to begin government-to-government consultation with Contra Costa County under Assembly Bill 52 (AB 52), pursuant to Public Resources Code (PRC) § 21080.3.1, on the Contra Costa County 2045 General Plan and the Climate Action Plan (CAP) Updates. Contra Costa County is the lead agency under the California Environmental Quality Act (CEQA) and is committed to working collaboratively with the Tribe to properly account for resources important to the Tribe.

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As of the date of preparation of this letter, the county has not been subject to a large, comprehensive survey for archaeological resources. The potential remains for as-yet undocumented resources to be present within the county.

Opportunity to Submit Information

As part of the cultural resources review of the Contra Costa County 2045 General Plan and the CAP Updates under CEQA, we are providing this notification as an opportunity for the Tribe to submit any information the Tribe is willing to share about cultural resources, including Tribal cultural resources as defined in PRC § 21074 that may be near the EIR Study Area (see Figure 2, *EIR Study Boundaries*). We understand that the locations of these resources are sensitive and resource locations would not be disclosed in public documents and will be kept confidential as provided for under California Government Code § 6254.10.

If the Tribe wishes to engage in formal government-to-government consultation with Contra Costa County for the Contra Costa County 2045 General Plan and the CAP Updates under AB 52 and PRC § 21080.3.1, please respond in writing within 30 calendar days of this notice **(by Monday, November 6, 2023)** with the Tribe's designated Point of Contact for consultation to:

Contra Costa County
Department of Conservation and Development
Attention: Will Nelson
30 Muir Road
Martinez, CA 94553

You may also respond by e-mail to will.nelson@dcd.cccounty.us. We will assume consultation is not desired and proceed with the Contra Costa County 2045 General Plan and the CAP Updates if we do not receive a response within the period provided by law. This notification does not limit the ability of the Tribe to submit information to Contra Costa County.

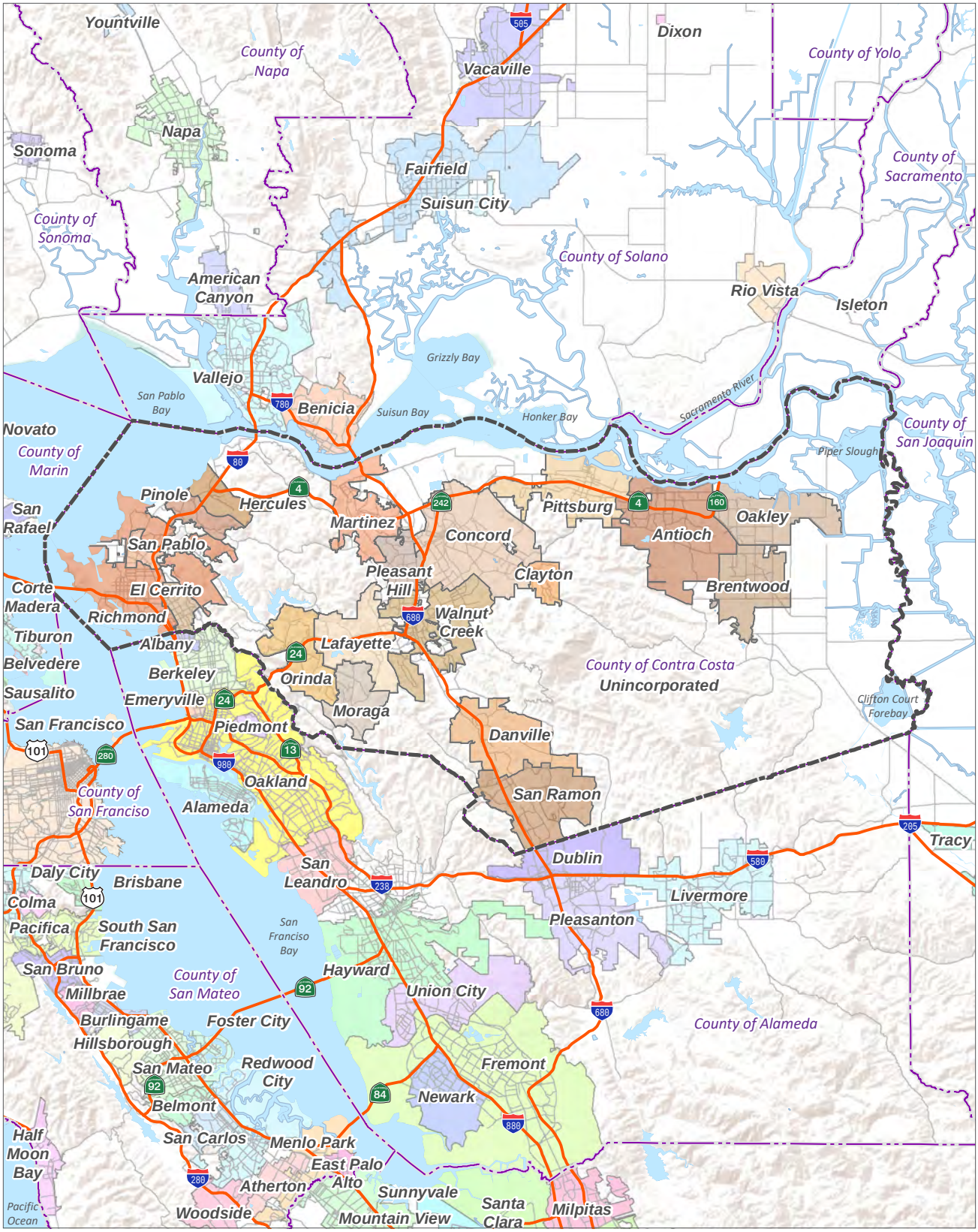
If you have any questions, please do not hesitate to call me at (925) 655-2898. Thank you and we look forward to your response.

Respectfully,



William R. Nelson
Principal Planner
Contra Costa County

Attachments:
Figure 1. Regional Location
Figure 2. EIR Study Boundaries



Source: ESRI, 2022

Contra Costa County Boundary

County Boundary

0 8

Scale (Miles)

Figure 1

Regional Location

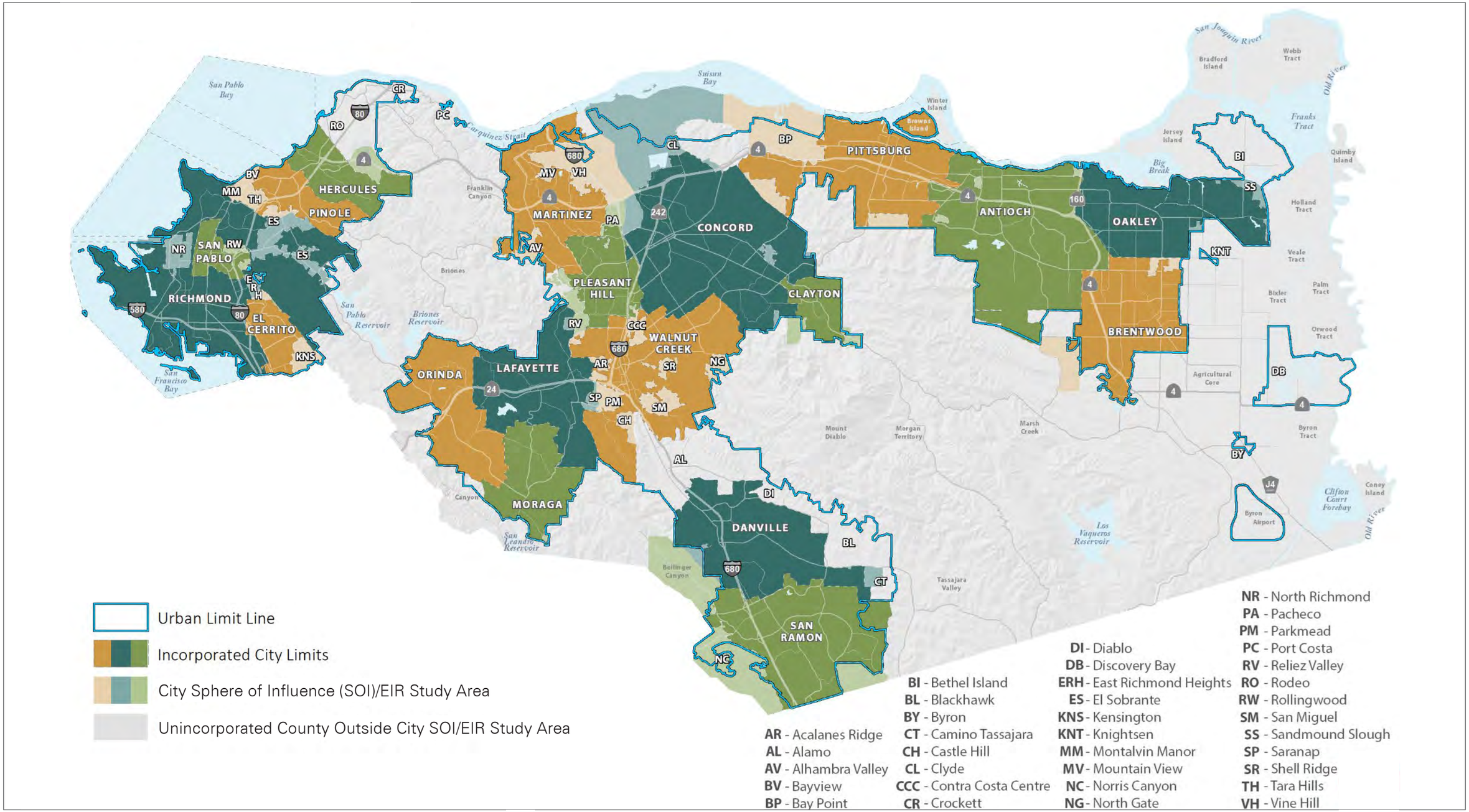


Figure 2
EIR Study Boundaries



This message was sent from a public e-mail system and may be subject to disclosure under the California Public Records Act.

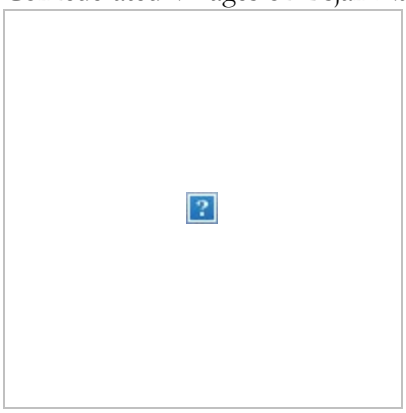
From: Lisjan Nation <cvltribe@gmail.com>
Sent: Wednesday, October 25, 2023 12:22 PM
To: Will Nelson <Will.Nelson@dcd.cccounty.us>
Subject: Contra Costa County 2045 General Plan and Climate Action Plan File Number GP18-0001

Hello,

Thank you for your email. The Tribe is requesting a copy of the final CHRIS and EIR for this project, along with the SLF from Native American Heritage Commission and any additional archeological reports. Our physical address is: PO BOX 6487 Oakland CA 94603 or if you would prefer to send them electronically, please send them to this email address.

'Uni (Respectfully),

Francis Ranstead
Confederated Villages of Lisjan Nation Tribal Administrative Assistant



Appendix 5.8-1 Climate Action Plan

Appendices

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Table 3 and **Figure 7** show the community-wide GHG emissions for the unincorporated county during the four inventory years. Total community-wide emissions declined 18 percent from 2005 to 2019. **Table 4** shows the proportion of GHG emissions from each sector for the unincorporated county for the four inventory years.

TABLE 3. ABSOLUTE ANNUAL GHG EMISSIONS, 2005 TO 2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Transportation (excluding BART)	628,200	651,130	571,650	464,040	-26%
Residential energy	294,930	280,870	212,420	191,780	-35%
Nonresidential energy	118,740	125,350	98,850*	159,520	34%
Solid waste	243,940	224,570	223,100	220,760	-10%
Agriculture	33,350	39,300	44,880	36,130	8%
Off-road equipment	34,160	36,290	42,840	54,010	58%
Water and wastewater	8,080	7,400	4,400	4,870	-40%
BART	1,040	1,320	1,440	190	-82%
Land use and sequestration	-70,860	-70,860	-70,860	-70,860	0%
Total Annual $MTCO_2e$	**1,291,580**	**1,295,370**	**1,128,720**	**1,060,440**	**-18%**
Informational Items					
Stationary sources	13,983,030	11,956,000	11,232,290	10,867,670	-22%
Wildfire	14,270	66,080	0**	10,100	N/A***

Note: All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

* Estimates of nonresidential electricity use in 2013 are used in 2017 to account for a lack of available data in 2017.

* No wildfires were recorded in the unincorporated county in 2017.

** Overall change between 2005 and 2019 for wildfire is not calculated because of the high degree of year-to-year variability.

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The transportation sector has consistently been the largest source of GHG emissions in the unincorporated county, accounting for between 46 and 53 percent of total community-wide GHG emissions (excluding informational items). Residential energy and solid waste are the second- and third-largest sources of GHG emissions, followed by nonresidential energy. Agriculture GHG emissions account for between 3 and 4 percent, and off-road equipment accounts for between 3 and 5 percent. GHG emissions from the water and wastewater and BART sectors are each 1 percent or less.

The sectors that experienced the largest decrease in annual GHG emissions between 2005 and 2019 were BART (82 percent), water and wastewater (40 percent), residential energy (35 percent), and transportation (26 percent). Emissions reductions also occurred in the solid waste sector (10 percent) and the nonresidential energy sector (8 percent). These changes are primarily due to an increase in renewable and carbon-free electricity and better resource-efficiency practices by community members. Two sectors, off-road equipment and agriculture, saw increases in their emissions from 2005 to 2019. Detailed summaries of changes in GHG emissions by sector appear in Appendix B.

The transportation sector has consistently been the largest source of GHG emissions in unincorporated Contra Costa County. The sectors that experienced the largest decrease in annual GHG emissions between 2005 and 2019 were BART, water and wastewater, residential energy, and transportation.

Per-Person GHG Emissions

Along with the "absolute" GHG emission levels discussed previously, the project team assessed the per-person GHG emissions from the unincorporated county. The team calculates per-person GHG emissions by taking the absolute GHG emissions in **Table 3** and dividing them by the number of residents in the unincorporated county for that inventory year. **Table 5** and **Figure 8** show the per-person emissions for the inventory years for the unincorporated county.

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Overall, per-person emissions declined 27 percent from 2005 to 2019. Because the population of the unincorporated county grew during this time, most sectors saw their per-person emissions decline. Even for sectors that had increases in their absolute emissions, such as Agriculture, population growth resulted in a decline in per-person emissions. The two sectors that saw an increase in per-person emissions were Off-road equipment, and Nonresidential energy, although the per-person emissions grew by 53 percent from 2005 to 2019 compared to a 73 percent increase in absolute emissions.

Per-person emissions declined 27 percent between 2005 and 2019.

TABLE 5. PER-PERSON GHG EMISSIONS, 2005 TO 2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Population					
Residents	154,270	165,700	174,110	174,150	13%
Emissions ($MTCO_2e$ per-person)					
Transportation	4.07	3.93	3.28	2.66	-35%
Residential energy	1.91	1.70	1.22	1.10	-42%
Solid waste	1.58	1.36	1.28	1.27	-20%
Nonresidential energy	0.77	0.76	0.57	0.92	19%
Agriculture	0.22	0.24	0.26	0.21	-4%
Off-road equipment	0.22	0.22	0.25	0.31	53%
Water and wastewater	0.05	0.04	0.03	0.03	-47%
BART	0.01	0.01	0.01	Less than 0.01	-84%
Land use and sequestration	-0.46	-0.43	-0.41	-0.41	-11%
Total Annual ($MTCO_2e$ per-person)	**8.37**	**7.82**	**6.48**	**6.09**	**-27%**
Informational Items					
Stationary Sources	90.64	72.15	64.51	62.40	-31%
Wildfire	0.09	0.40	0.00	0.06	N/A*

Note: All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

* Overall change between 2005 and 2019 is not calculated because of the high degree of year-to-year variability.

Many factors contribute to changes in GHG emissions. Key factors may include changes in electricity and natural gas use, the proportion of electricity obtained from carbon-free sources, VMT, vehicle fuel efficiency, landfilled waste tonnage, temperature (affecting heating and cooling demand), and demographic changes (e.g., changes in population, household, and job numbers). Sector-specific descriptions of sources of and changes in GHG emissions are provided in **Appendix B**.

CONSUMPTION-BASED INVENTORY EMISSIONS

The community-wide GHG inventory presented for the unincorporated county is a protocol-compliant, production-based inventory, which means that it assesses the GHG emissions produced by activities occurring in the community. However, the inventory does not account for most of the emissions created by the consumption of food or material goods or use of services in the unincorporated county, including emissions from the manufacture and transportation of goods purchased in the community, food grown and processed in other locations, air travel by unincorporated Contra Costa County community members, and the disposal or reprocessing of certain materials and products. For example, if someone who lives or works in an unincorporated county community purchases new clothes, the production-based inventory will include vehicle emissions for the trip to and from the store, energy use at the store and home, and any landfilled waste generated. It would not include emissions from the growing and processing of the raw materials in the clothes, the manufacturing of the clothes, transportation of the clothes to the store, or the reprocessing of any waste materials that do not end up in a landfill, unless these activities occur within the unincorporated county.

A consumption-based inventory assesses emissions associated with the manufacture, transportation, and disposal of these goods and services regardless of where they occur.

In contrast to a production-based inventory, a second type of GHG inventory, known as a consumption-based inventory, looks at a wider array of GHG emissions created by the goods and services used by unincorporated county community members, including residents, businesses, and employees. A consumption-based inventory assesses emissions associated with the manufacture, transportation, and disposal of these goods and services regardless of where they occur. Such inventories can provide a more complete picture of the GHG emissions associated with the lifestyle and consumer behavior of unincorporated county community members.

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A consumption-based inventory is more complex to prepare than a production-based inventory. There are not established protocols and methods for consumption-based inventories, and California does not yet have a statewide consumption-based inventory or any guidance for preparing one. Due to these limitations, the project team did not prepare one as part of this 2024 CAP. In 2015, BAAQMD worked with the Cool Climate Network at the University of California, Berkeley, to prepare a consumption-based inventory for all Bay Area jurisdictions. This inventory includes GHG emissions from the following sources:

- **Travel:** GHG emissions from fuel use by on-road vehicles, vehicle manufacturing and repairs, public transportation, and air travel.
- **Housing**: GHG emissions from electricity and natural gas use in homes as well as other fuels associated with home heating (such as kerosene or fuel oil), electricity emissions from water and wastewater activities, and waste emissions. This category also includes emissions from the manufacture, transportation, and construction and demolition of materials used to construct houses.
- **Food**: GHG emissions from the growth, processing/manufacturing, and transportation of food products.
- **Goods**: GHG emissions from the manufacture, transportation, and disposal of consumer products, such as home furnishings, appliances and electronics, clothing, and healthcare and personal items.
- **Services**: GHG emissions from personal and business services, including entertainment and recreation, communication, education, healthcare, and maintenance and repair activities.

Some of these GHG emission sources are also included in the production-based inventory prepared as part of the 2024 CAP, and others are covered by either the production-based or consumption-based inventory but not both. According to the consumption-based inventory, transportation is responsible for 34 percent of emissions produced by activities conducted and goods consumed within unincorporated Contra Costa County. Food is responsible for 19 percent, goods and services for 17 percent each, and housing for 13 percent (see **Figure 10**).

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GHG Forecast

The following sections present the results of the community-wide and County operations GHG emissions forecasts for the years 2030 and 2045. For a detailed description of GHG forecast methods and assumptions, see **Appendix B**.

ABSOLUTE GHG EMISSIONS FORECAST

Table 7 and **Figure 11** show unincorporated Contra Costa County's projected future GHG emissions relative to the 2019 inventory. These projections are obtained by applying projected changes in community population to resource use and transportation behavior recorded in 2019. As such, these projections do not account for any potential changes in transportation or resource use directly resulting from the COVID-19 pandemic, the long-term effects of which are not currently known.

Most sectors show an increase in GHG emissions due to the growing population. Agricultural emissions decrease because the amount of land used for agricultural purposes is projected to decline. Although the land use and sequestration sector is expected to remain a net carbon sink (negative emissions), the amount of emissions sequestered (removed from the atmosphere) by the activities in this sector are projected to decline. This is due to anticipated development of currently undeveloped land, removing the potential for this land to sequester, or store, carbon. Sequestration in forested and urbanized areas is projected to increase slightly.

TABLE 7. ABSOLUTE GHG EMISSIONS FORECAST, 2019 TO 2045

Sector	2019	2030	2045	Percentage Change, 2019–2045
Transportation	464,040	542,020	605,080	30%
Residential energy	191,780	217,710	259,380	35%
Nonresidential energy	159,520	167,720	180,200	13%
Solid waste	220,760	229,450	260,490	18%
Agriculture	36,130	34,770	33,410	-8%
Off-road equipment	54,010	69,520	76,100	41%
Water and wastewater	4,870	5,530	6,590	35%
BART	190	220	260	37%
Land use and sequestration	-70,860	-67,580	-58,890	-17%
Total Annual $MTCO_2e$	1,060,440	1,199,360	1,362,620	28%

4. GHG EMISSION REDUCTION STRATEGY



Briones Valley. Photo credit: Stephen Joseph.

GHG Emissions Reduction Goals

A key part of any CAP is one or more goals for future GHG emissions levels. These goals may be "firm" levels of GHG emission reductions supported by State regulations and local commitments (also called regulatory goals) or aspirations that go beyond adopted minimums and represent a higher level of GHG emission reductions that communities can strive toward. The 2024 CAP includes GHG emission reduction goals for 2030 and 2045.

As discussed in **Chapter 2**, California has two statewide regulatory goals for reduction of GHGs:

- Reduce GHG emissions to 40 percent below 1990 levels by 2030. This goal was codified into law by SB 32.
- Reduce emissions to 85 percent below 1990 levels and achieve net carbon neutrality by 2045. This is the goal codified by AB 1279.

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The 2022 Scoping Plan recommends that local governments support statewide efforts to achieve net carbon neutrality by achieving an 85 percent reduction in GHG emissions compared to 1990 by 2045. The 2022 Scoping Plan also removes specific goals for per-person emissions reductions that appeared in previous versions. The BAAQMD 2020 CEQA Guidelines,[7] *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans*, require that local climate action plans such as the 2024 CAP be consistent with these State-level goals.

CONTRA COSTA COUNTY'S GHG EMISSION REDUCTION GOALS

Local GHG emissions reduction efforts, such as this 2024 CAP, may select any GHG emissions reduction goals that are appropriate for unincorporated Contra Costa County. However, to comply with State and regional guidelines for CEQA, the GHG emission reduction goals in the 2024 CAP should be broadly consistent with the State-level goals. Additionally, the 2045 General Plan informs the County's land use decisions and related policies out to 2045; therefore, consistency with the State's 2045 goal also aligns with the General Plan's horizon year. Given these considerations, the GHG emissions reduction goals for Contra Costa County are:

- Reduce GHG emissions to 658,700 $MTCO_2e$ by 2030.
- Reduce GHG emissions to 164,680 $MTCO_2e$ by 2045.

Table 8 and **Figure 12** show these emission goals and how they compare to the County's projected GHG emissions in **Chapter 3**.

TABLE 8. CONTRA COSTA COUNTY GHG EMISSIONS AND EMISSION GOALS, 2019 TO 2045

	2019	2030	2045
Forecast GHG emissions	1,060,440 $MTCO_2e$	1,199,360 $MTCO_2e$	1,362,620 $MTCO_2e$
Goal	None	658,700 $MTCO_2e$	164,680 $MTCO_2e$
GHG emissions to be reduced	N/A	540,660 $MTCO_2e$	1,197,940 $MTCO_2e$

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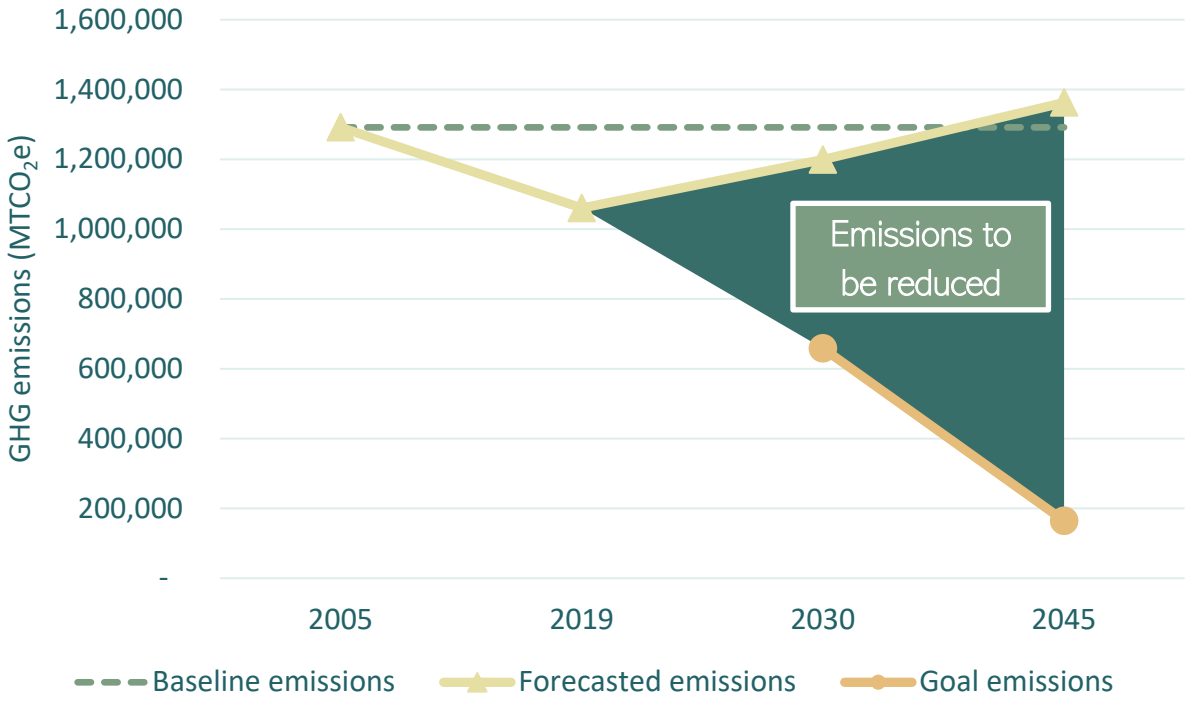
FIGURE 12. GHG EMISSION LEVELS AND REDUCTION GOALS



Existing and Planned GHG Emissions Reduction Efforts

The County must substantially reduce its GHG emissions to achieve its goals. Fortunately, there are already several efforts in place or planned at the State and regional level that are expected to reduce GHG emissions in the unincorporated areas of Contra Costa County without the County taking additional action. The County can receive "credit" for the level of GHG emissions reduced locally by these existing and planned efforts.

California has adopted and committed to implementing policies to decrease GHG emission levels statewide, including from several of the major GHG emission sources in the unincorporated areas of Contra Costa County. Many of these policies are identified in the 2008 Scoping Plan and have been revised and expanded by successive updates.

The Scoping Plan and related documents lay out several State-led policies to reduce GHG emissions, but six policies have a direct and apparent GHG emission reduction benefit to unincorporated Contra Costa County: The Renewables Portfolio Standard (RPS), Clean Car Standards, Title 24 building energy efficiency standards, the Low Carbon Fuel Standard

(LCFS), the Short-Lived Climate Pollutant Reduction Strategy, and Renewable Natural Gas. An in-depth description of these initiatives and their projected GHG emission savings are provided in Appendix B.

1. **The Renewables Portfolio Standard** requires increases in renewable and carbon-free electricity supplies.
2. **The Clean Car Standards** require increased fuel efficiency of on-road vehicles and decreased carbon intensity of vehicle fuels.
3. The updated **Title 24 building energy efficiency standards** require new buildings to achieve increased energy-efficiency goals, and in some cases to install rooftop solar panels. The latest version of these standards went into effect January 1, 2023.
4. **The Low Carbon Fuel Standard** mandates reduced carbon intensity of fuels used in off-road equipment.
5. **The Short-Lived Climate Pollutant Reduction Strategy**, also known as SB 1383, requires that jurisdictions provide organic waste collection services, recover edible food, and keep most organic waste out of landfills.
6. **Renewable Natural Gas** assumes that biomethane and renewable hydrogen fuels will be blended into the fossil gas pipeline and that, in the 2030s, dedicated hydrogen pipelines will be constructed to serve certain industrial clusters.

The project team estimated GHG savings from the Clean Car Standards using State modeling tools released in 2021. These models do not consider newer State regulations to accelerate the transition to zero-emission vehicles, and so they do not reflect all the expected GHG reductions from zero-emission vehicles in Contra Costa County. The remaining savings are covered in Strategy TR-2, which is discussed later in this chapter.

In addition to State actions, the County's default electricity provider, MCE, has also taken action to reduce the GHG emissions from the electricity it supplies to unincorporated Contra Costa County community members, beyond the minimum required by the RPS. In 2019, MCE electricity was approximately 60 percent renewable and 90 percent carbon free. In future years, MCE will work to source 95 percent of its electricity from carbon-free sources. When quantifying the emissions impacts from electricity procurement policies, GHG emissions reductions from RPS are considered first. The reductions from MCE clean energy procurement shown in **Table 9** represent savings obtained after the effects of the RPS have been considered. **Table 9** shows the GHG emissions reduction potential from the State-level efforts and MCE's energy procurement plans and projected levels of adoption of

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MCE Deep Green, as well as how unincorporated Contra Costa County's GHG emission levels with these reductions compares to the goals discussed previously.

TABLE 9. GHG EMISSION REDUCTIONS FROM EXISTING AND PLANNED ACTIONS, 2019 TO 2045

	2019 $MTCO_2E$	2030 $MTCO_2E$	2045 $MTCO_2E$
Forecast emissions without existing and planned actions	1,060,440	1,199,360	1,362,620
Reductions from RPS	-	-24,620	-115,400
Reductions from Clean Car standards	-	-110,250	-214,120
Reductions from Title 24	-	-10,460	-33,710
Reductions from LCFS (off-road only)*	-	-740	-7,430
Reductions from SB 1383		-21,880	-53,870
Reductions from renewable natural gas	-	-17,180	-73,670
Reductions from MCE clean energy procurement	-	-1,240	-
Reductions from all actions		-185,520	-483,340
Remaining emissions with existing and planned actions	1,060,440	1,013,840	879,280

*Due to how the off-road equipment emissions from LCFS are calculated, the results show a minor increase in emissions from this sector.

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Achieving Our Goals

County staff developed a set of 11 GHG emission reduction strategies and assessed the GHG emission reduction potential of these strategies, given the project team's reasonable understanding of available resources and what seemed appropriate for the unincorporated area. **Appendix B** provides detailed information about the GHG emission reduction potential of these strategies.

With the reductions currently projected from the 2024 CAP strategies, GHG emissions for the unincorporated areas of Contra Costa County are expected to fall to 1.47 $MTCO_2e$ per person. This is 55 percent below GHG emissions without the 2024 CAP.

These GHG emission reduction potentials are intended to be a starting point. They are based on the best available information, the experience and expertise of County staff, and known resources and capabilities. It is possible to achieve greater reductions if there is more confidence in higher levels of participation or development of additional programs. **Table 10** shows the expected GHG emission levels with these strategies enacted,

TABLE 10. GHG EMISSIONS WITH 2024 CAP DRAFT REDUCTION STRATEGIES, 2019 TO 2045

Sector	2019	2030	2045	Percentage Change, 2019–2045
Transportation	464,040	277,450	65,660	-86%
Residential Energy	191,780	117,440	21,730	-89%
Nonresidential Energy	159,520	114,720	10,430	-93%
Solid Waste	220,760	146,270	137,070	-38%
Agriculture	36,130	34,770	33,410	-8%
Off-road Equipment	54,010	54,150	35,640	-34%
Water and Wastewater	4,870	3,610	1,470	-70%
BART	190	150	50	-74%
Land Use and Sequestration	-70,860	-90,210	-147,800	109%
Total Annual $MTCO_2e$	**1,060,440**	**658,300**	**157,610**	**-85%**
Note: Due to rounding, totals may not equal the sum of the individual values				

With the reductions currently projected from the 2024 GHG emissions reduction strategies, GHG emissions for the unincorporated county are expected to be reduced to 86 percent below 1990 levels, equal to 88 percent below baseline 2005 levels or 85 percent below

2019 levels. These reductions are predicted to occur across most GHG emission sectors, though emissions within the Solid Waste sector will continue to be affected by previously deposited waste continuing to decompose in landfills. As noted previously, there is the potential for these strategies to yield additional GHG emission reductions as County staff and decision makers develop and institute implementation actions and monitor the results.

With these reductions as currently assessed, unincorporated Contra Costa County achieves the GHG emissions reduction goals for 2030 and 2045, as shown in **Table 11**.

TABLE 11. 2024 GHG EMISSION REDUCTIONS AND REGULATORY GOALS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG emissions reduction goals	658,700	164,680
GHG emissions with CAP strategies	658,300	157,610
Gap to GHG emission reduction goal*	-400	-7,070

Note: Due to rounding, totals may not equal the sum of the individual values.
* Negative values mean that the strategies reduce GHG emissions to below the goal.

THE 2024 CAP AND CARBON NEUTRALITY

The 2024 CAP achieves significant reductions in GHG emissions and places Contra Costa County on a path to support statewide carbon neutrality by 2045. Currently, there is insufficient guidance and certainty around local carbon sequestration, storage, and potential carbon offset strategies to mathematically demonstrate with certainty that the 2024 CAP will achieve carbon neutrality by 2045. However, the County believes that such guidance and certainty will emerge in future years as the County, regional agencies, and the State further explore the opportunities, develop guidance and methods, and validate new technology. When available, guidance on quantifying how to achieve carbon neutrality will be integrated into future updates of this 2024 CAP.

For the foreseeable future, achieving the County's GHG emissions reductions goals, including carbon neutrality, will likely not be feasible without the use of local carbon sequestration, notably on natural and working lands. Although GHG emissions can be eliminated from many of the County's GHG emissions sources, this is not practical for every source given technical, economic, or political considerations. Assuming implementation of the strategies in this 2024 CAP, **Figure 15** shows the major sources of Contra Costa County's remaining GHG emissions in 2045.

APPENDIX B: TECHNICAL GHG APPENDIX

This appendix provides details for Contra Costa County's greenhouse gas (GHG) emissions inventory and forecast in Chapter 3 of the 2024 Climate Action Plan (CAP) and the GHG emission reduction pathway presented in Chapter 4 of the 2024 CAP. It summarizes the technical details and findings from these analyses as well as the data sources, assumptions, and performance metrics used to assess the potential for GHG savings from state and local existing and planned efforts and the reduction strategies associated with the CAP.

Inventory and Forecast

As part of the preparation of the 2015 CAP, Contra Costa County and its regional partners and technical consultants prepared community-wide and County operations GHG inventories for the calendar years 2005 and 2013. The 2015 CAP identified the year 2005 as the baseline year for emission reductions, as this was considered a year with good data availability at the time, consistent with State guidance, and without any unusual factors that might affect GHG emissions.

As part of the 2024 CAP update process, the project teams prepared inventories of community-wide emissions for the years 2017 and 2019. County staff made some updates to the 2005 and 2013 community-wide inventories in the 2015 CAP to ensure a consistent method and approach across all inventory years.

County staff have also prepared a County operations GHG emissions inventory for the year 2017.

This document presents the full results of the Contra Costa County community-wide GHG inventory and the County operations inventory and is the most up-to-date summary of Contra Costa County's GHG emissions.

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PROTOCOLS

A series of guidance documents, called protocols, provide recommendations on how to adequately assess GHG emissions. The project team prepared the new GHG inventories and updates to past GHG inventories consistent with the guidance in widely adopted, standard protocol documents. These protocols provide guidance on what activities should be evaluated in the GHG inventories and how emissions from those activities should be assessed. Using standard methods also allows for an easy comparison of GHG emission levels across multiple years and communities.

- The County operations GHG inventory relies on the Local Government Operations Protocol (LGOP), which was first developed in 2008 and was updated in 2010. The LGOP is a tool for accounting and reporting GHG emissions of local government (municipal) operations and is used throughout California and the United States. The LGOP includes guidance from several existing programs as well as the state's mandatory GHG reporting regulations.
- The community-wide GHG inventory uses the United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol), which was first developed in 2012 and updated most recently in 2019. The California Governor's Office of Planning and Research encourages cities and counties in California to follow the U.S. Community Protocol for community-wide GHG emissions.
- A third protocol, the Global Protocol for Community-Scale Greenhouse Gas Inventories (Global Protocol) was first developed in 2014 and is intended for use in preparing international community-scale GHG inventories. It is largely consistent with the U.S. Community Protocol, although it contains additional guidance and resources to support a wider range of activities that may be found in other countries. The project team has used the Global Protocol to assess GHG emissions from sources that are not covered in the U.S. Community Protocol.

GHG inventories are estimates of GHG emissions based on these standard methods and verified datasets. While they are not direct measurements of GHG emissions, the use of the standard methods identified in the protocols, in combination with accurate data from appropriate sources, allows GHG inventories to provide reliable estimates of local emission levels. Due to potential data limitations, some inconsistencies in methods may remain. Any concerns about inconsistent methods are noted in the appropriate sector discussion.

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UNITS OF MEASUREMENT

GHG inventories and forecasts assess emissions in a unit called carbon dioxide equivalent (CO_2e), which is a combined unit of all GHGs analyzed in the inventory. As different GHGs have different effects on the processes that drive climate change, CO_2e is a weighted unit that reflects the relative potency of the different GHGs. These inventories report amounts of GHGs in metric tons of CO_2e ($MTCO_2e$), equal to 1,000 kilograms or approximately 2,205 pounds.

EMISSION FACTORS

An emission factor describes how many $MTCO_2e$ are released per unit of an activity. For instance, an emission factor for electricity describes the $MTCO_2e$ produced per kilowatt hours (kWh) of electricity used. Since different sources of electricity can have different emission factors, the emission factors in **Table B-1** represent a weighted average of emission factors across electricity sources and portfolios (e.g. MCE's Light Green and Deep Green products). The emission factor for on-road transportation describes the $MTCO_2e$ produced per mile of driving. The project team calculated most of the GHG emissions using data on GHG-generating activities in combination with emission factors. Some sources of GHG emissions (known as sectors), including agriculture and off-road emissions, are calculated using formulae or models and do not have specific emission factors. **Table B-1** shows the emission factors for the inventory years for the unincorporated area.

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TABLE B-1: GHG INVENTORY EMISSION FACTORS, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change	Source
PG&E electricity ($MTCO_2e$/kWh)	0.000226	0.000195	0.000096	0.000108	-52%	PG&E
Direct access electricity ($MTCO_2e$/ kWh)	0.000388	0.000309	0.000208	0.000187	-52%	California Energy Commission
MCE electricity ($MTCO_2e$/ kWh)	N/A	N/A	0.000059	0.000045	-24% *	MCE
Natural gas ($MTCO_2e$/therm)	0.005311	0.005311	0.005311	0.005311	0%	US Community Protocol
Propane ($MTCO_2e$/gallon)	0.005844	0.005844	0.005844	0.005844	0%	US Community Protocol
Kerosene ($MTCO_2e$/gallon)	0.010569	0.010569	0.010569	0.010569	0%	US Community Protocol
Wood ($MTCO_2e$/MMBTU)	0.095624	0.095624	0.095624	0.095624	0%	US Community Protocol
On-road vehicles ($MTCO_2e$/VMT)	0.000486	0.000483	0.000421	0.000408	-16%	California Air Resources Board
BART ($MTCO_2e$/ passenger mile)	0.000093	0.000093	0.000093	0.000013	-86%	BART
Municipal solid waste ($MTCO_2e$/ton)	0.293179	0.293184	0.286047	0.261659	-11%	CalRecycle
Alternative daily cover ($MTCO_2e$/ton)	0.191850	0.245890	0.245694	0.245693	28%	CalRecycle

* MCE's percentage change is from 2017 to 2019.

COMMUNITY-WIDE EMISSIONS

Sectors

The community-wide GHG inventory assessed GHG emissions from the following 11 categories of activities, known as sectors.



- **Transportation** includes GHG emissions created by driving on-road vehicles in the unincorporated county, including passenger and freight vehicles.



- **Residential energy** includes GHG emissions attributed to the use of electricity, natural gas, and other home heating fuels in residential buildings.



- **Solid waste** includes the GHG emissions released from trash collected in the unincorporated areas of Contra Costa County, as well as collective annual emissions from waste already in place at the Acme, Keller Canyon, and West Contra Costa Landfills.



- **Nonresidential energy** includes GHG emissions attributed to the use of electricity and natural gas in nonresidential buildings.



- **Agriculture** includes GHG emissions from various agricultural activities in the unincorporated county, including agricultural equipment, crop cultivation and harvesting, and livestock operations.



- **Off-road equipment** includes GHG emissions from equipment that does not provide on-road transportation (excluding agricultural equipment), such as tractors for construction or equipment used for landscape maintenance.



- **Water and wastewater** accounts for the electricity used to transport and process water and wastewater used or generated by unincorporated county residents and businesses, as well as direct emissions resulting from wastewater treatment activities.



- **Bay Area Rapid Transit (BART)** includes GHG emissions associated with the operation of BART for unincorporated county residents.



- **Land use and sequestration** includes GHG emissions absorbed and stored in trees and soils on locally controlled lands as part of healthy ecosystems and released into the atmosphere from development of previously undeveloped land.

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- **Stationary sources** are emissions from fuel use at major industrial facilities, permitted by state and regional air quality authorities. These emissions are informational and are not counted as part of the community total.
- **Wildfire** includes emissions released as a result of wildfires. These emissions are informational and are not counted as part of the community total.

Community-Wide Inventory Results

Table B-2 show the community-wide GHG emissions for the unincorporated area associated for the four inventory years. Total community-wide emissions declined 22 percent from 2005 to 2019. The most significant decreases in emissions came from BART, water and wastewater, residential energy use, and transportation, which all saw their associated emissions decrease by more than 25 percent. Only off-road equipment saw a significant (58 percent) increase in associated GHG emissions.

TABLE B-2: ABSOLUTE ANNUAL GHG EMISSIONS, 2005–2019 ($MTCO_2E$)

Sector	2005	2013	2017	2019	Percentage Change, 2005 - 2019
Transportation	628,200	651,130	571,650	464,040	-26%
Residential energy	294,930	280,870	212,420	191,780	-35%
Nonresidential energy	118,740	125,350	98,850	159,520	34%
Solid waste	243,940	224,570	223,100	220,760	-10%
Agriculture	33,350	39,300	44,880	36,130	8%
Off-road equipment	34,160	36,290	42,840	54,010	58%
Water and wastewater	8,080	7,400	4,400	4,870	-40%
BART	1,040	1,320	1,440	190	-82%
Land use and sequestration	-70,860	-70,860	-70,860	-70,860	0%
Total Annual $MTCO_2e$	**1,291,580**	**1,295,370**	**1,128,720**	**1,060,440**	**-18%**
Informational Items					
Stationary sources	13,983,030	11,956,000	11,232,290	10,867,670	-22%
Wildfire	14,270	66,080	0*	10,100	N/A

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

*No wildfires were recorded within the unincorporated County in 2017.

COMMUNITY-WIDE GHG INVENTORY RESULTS BY SECTOR

Transportation

On-road transportation activity accounts for vehicle miles driven between two points in the unincorporated area, or between the unincorporated area or another community. It does not include miles for trips that begin and end in other communities but pass through the unincorporated area (e.g., from Sacramento to Oakland). Unincorporated Contra Costa County community members drove approximately 1.3 billion vehicle miles in 2005, decreasing 12 percent to approximately 1.1 billion vehicle miles in 2019. The VMT in 2005 resulted in GHG emissions of approximately 628,200 $MTCO_2e$, which dropped to approximately 464,040 in 2019, a 26-percent decrease. GHG emissions decreased due to this reduction in VMT, increasingly fuel-efficient vehicles, and a wider adoption of electric vehicles. The average vehicle on the road in unincorporated Contra Costa County generated 16 percent fewer GHG emissions per mile in 2019 than in 2005, as reported by Caltrans. **Table B-3** provides a breakdown of the activity data and emissions for on-road transportation for the unincorporated area by each individual year included in the updated community inventory.

TABLE B-3: TRANSPORTATION ACTIVITY DATA AND GHG EMISSIONS, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005 - 2019
Activity Data (VMT)					
On-road transportation	1,291,819,230	1,349,279,980	1,357,121,160	1,136,911,090	-12%
Emissions ($MTCO_2e$)					
On-road transportation	628,200	651,130	571,650	464,040	-26%
All numbers are rounded to the nearest 10.					

Residential Energy

Contra Costa County's GHG emissions from residential energy totaled approximately 191,780 $MTCO_2e$ in 2019, compared to 294,930 $MTCO_2e$ in 2005, a decline of 35 percent. Residential electricity GHG emissions decreased due to a decrease in overall use and usage of cleaner sources of electricity. Residential electricity use fell 40 percent from 2005 to 2019, from 488,236,740 kWh to 293,561,300 kWh. Over this period, as seen in **Table B-1**, a

unit of electricity supplied by PG&E emitted 52 percent less GHG in 2019 than in 2005. Electricity from MCE, which supplied electricity to community residents in 2017 and 2019, generated even fewer GHG emissions per unit of electricity than PG&E-supplied electricity, which has also contributed to the decline in this sector. Natural gas use and GHG emissions saw a small decrease from 2005 to 2019 of 3 percent despite a growing population. Propane and wood use and GHG emissions also declined over this period, although GHG emissions from these fuels are only a small proportion of those from the residential energy sector. **Table B-4** provides a breakdown of the activity data and GHG emissions for residential energy for the unincorporated area.

TABLE B-4: RESIDENTIAL ENERGY ACTIVITY DATA AND GHG EMISSIONS BY SUBSECTOR, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005 - 2019
Activity Data					
Residential PG&E electricity (kWh)	488,236,740	478,219,710	461,970,670	46,158,330	-91%
Residential MCE electricity (kWh)	-	-	307,820	247,402,970	80,273%*
Residential natural gas (therms)	30,919,160	31,007,110	28,634,420	30,100,640	-3%
Residential propane (gallons)	1,525,330	1,106,900	1,043,270	1,021,340	-33%
Residential kerosene (gallons)	13,160	10,960	8,030	16,320	24%
Residential wood (MMBTU)	117,000	165,830	100,960	101,710	-13%
Emissions ($MTCO_2e$)					
Residential PG&E electricity	110,120	93,380	44,510	5,000	-95%
Residential MCE electricity	0	0	20	11,060	55,200%*
Residential natural gas	164,570	165,040	152,060	159,850	-3%
Residential propane	8,910	6,470	6,100	5,970	-33%
Residential kerosene	140	120	80	170	21%
Residential wood	11,190	15,860	9,650	9,730	-13%
Total Annual $MTCO_2e$	**294,930**	**280,870**	**212,420**	**191,780**	**-35%**

* MCE did not operate in the unincorporated County until 2017, and 2017 operations were very limited. MCE percentage changes are for changes from 2017 to 2019.

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

Solid Waste

Contra Costa County's community-wide GHG emissions associated with solid waste includes four subsectors.

- Municipal solid waste (MSW) is the material that is discarded by community members and reflects the actual waste generated by the community.
- Alternative daily cover (ADC) is organic material applied at landfills by the landfill operator as a means of controlling debris and pests.
- Waste in place is the solid waste and associated GHG emissions deposited in the County's landfills in previous years.
- The flaring subsector accounts for GHG emissions from the combustion of gases generated by the decomposing waste.

Between 2005 and 2019, total solid waste GHG emissions decreased by 10 percent due to decreases in solid waste generated and ADC applied, likely as a result of increased community awareness about recycling and composting and the availability of curbside recycling programs. Although annual waste generation decreased, waste in place at the landfills increased as waste is added to the landfills each year. **Table B-5** presents solid waste emissions data for each year for the unincorporated area.

TABLE B-5: SOLID WASTE ACTIVITY DATA AND GHG EMISSIONS BY SUBSECTOR, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005 – 2019
Activity Data (Tons)					
Solid waste	154,820	78,790	79,520	79,340	-49%
ADC	15,950	13,990	11,470	7,580	-52%
Waste in place	34,455,010	41,785,650	45,776,140	47,618,290	38%
Landfill flaring	5,270	5,260	5,250	5,270	Less than 1%
Emissions ($MTCO_2e$)					
Solid waste	45,390	23,100	22,750	20,760	-54%
ADC	3,060	3,440	2,820	1,860	-39%
Waste in place	193,950	196,500	196,000	196,610	1%
Landfill flaring	1,540	1,530	13,550	13,590	-1%
Total Annual $MTCO_2e$	**243,940**	**224,570**	**235,120**	**232,820**	**-10%**

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

Nonresidential Energy

Contra Costa County's GHG emissions from nonresidential energy totaled approximately 159,520 $MTCO_2e$ in 2019, compared to 118,740 $MTCO_2e$ in 2005, an increase of 34 percent. Electricity emissions from retail electricity suppliers (PG&E and MCE) have fallen significantly, driven by a small decrease in electricity use and a large increase in the amount of electricity for renewable and carbon-free sources (see **Table B-1**). Between 2005 and 2019, nonresidential electricity obtained from PG&E decreased by 90 percent and nonresidential electricity obtained from MCE increased from virtually nothing in 2017 to approximately 200 million kWh in 2019. Natural gas use and associated emissions have reportedly increased, although this may be less of an actual increase and more so the result of data being omitted by PG&E as a way of complying with state privacy regulations. As a consequence of this, the project team has kept nonresidential natural gas use constant at 2013 levels, a conservative estimate that may not account for actual decreases in this subsector. Similarly, direct access electricity (electricity purchased from third parties instead of PG&E or MCE, usually by large customers such as major industrial facilities) was only reported for 2019, although this electricity use likely occurred in previous years but was not reported due to privacy regulations. **Table B-6** provides a breakdown of the activity data and GHG emissions for nonresidential energy for the unincorporated area.

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TABLE B-6: NONRESIDENTIAL ENERGY ACTIVITY DATA AND GHG EMISSIONS BY SUBSECTOR, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Activity Data					
Nonresidential PG&E Electricity (kWh) [1]	284,558,070	266,216,660	266,216,660	29,062,250	-90%
Nonresidential MCE electricity (kWh) [2]	0	0	28,730	200,181,720	696,669%
Nonresidential Direct Access electricity (kWh) [3]	0	0	0	396,805,940	N/A
Nonresidential natural gas (therms) [4]	10,251,360	13,784,410	13,784,410	13,784,410	-58%
Emissions ($MTCO_2e$)					
Nonresidential PG&E electricity [1]	64,180	51,980	25,650	3,150	-95%
Nonresidential MCE electricity [2]	0	0	Less than 10	9,040	451,900%
Nonresidential Direct Access electricity [3]	0	0	0	74,130	N/A
Nonresidential natural gas [4]	54,560	73,370	73,200	73,200	34%
Total Annual $MTCO_2e$	**118,740**	**125,350**	**98,850**	**159,520**	**34%**

1: Due to omissions in data reported by PG&E for the calendar year 2017, the project team assumed that electricity use remained constant from 2013 levels.

2: MCE did not operate in the unincorporated County until 2017, and 2017 operations were very limited. MCE percentage changes are for changes from 2017 to 2019.

3: Direct access electricity was only reported for 2019. As PG&E also reports MCE-supplied electricity as Direct Access, the numbers given in this table are the electricity use after MCE data are removed.

4: Due to omissions in data reported by PG&E for the calendar years 2017 and 2019, the project team assumed that natural gas use remained constant from 2013 levels.

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

Agricultural Emissions

GHG emissions associated with the agriculture sector for the unincorporated area increased by approximately 8 percent between 2005 and 2019, as shown in **Table B-7**. This increase is due primarily to a minor increase (5 percent) in the amount of cattle in the county. Although crop acreages declined from 2005 to 2019, more fertilizer was applied in 2019 than in 2005 due to a shift in the types of crops being grown that required slightly more fertilizer.

TABLE B-7: AGRICULTURE ACTIVITY DATA AND GHG EMISSIONS BY SUBSECTOR, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Activity Data					
Crops (acreage)	200,980	204,031	197,360	183,730	-9%
Nitrogen applied (pounds)	3,261,620	3,560,480	3,698,500	3,608,340	11%
Livestock (effective annual population)	16,500	19,110	22,060	17,340	5%
Emissions ($MTCO_2e$)					
Crops	3,920	4,280	4,450	4,340	11%
Enteric fermentation	28,510	33,920	39,160	30,790	8%
Manure management	920	1,100	1,270	1,000	9%
Total Annual $MTCO_2e$	33,350	39,300	44,880	36,130	8%

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

Off-Road Equipment Emissions

According to data shown in **Table B-8**, emissions from off-road equipment in unincorporated Contra Costa County increased approximately 73 percent between 2005 and 2019, although the sector overall remains a small proportion of the total community-wide emissions. This increase is primarily the result of a significant rise in diesel tractor and other agricultural equipment use over this period, along with increases in commercial and industrial/warehouse equipment use. Since this is modeling directly reported by State agencies, it is possible that changes in modeling methods may be affecting the results. Note that the State provides these GHG emission levels directly, so there is no activity data to display.

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TABLE B-8: OFF-ROAD EQUIPMENT GHG EMISSIONS BY SUBSECTOR, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005 – 2019
Agricultural equipment	1,200	1,190	1,180	10,170	748%
Cargo handling equipment	900	380	330	310	-66%
Commercial harbor equipment *	0	0	0	2,600	N/A
Construction and mining equipment	6,780	7,170	8,880	7,200	6%
Industrial equipment	8,320	8,840	9,470	9,780	18%
Lawn and garden equipment	3,580	3,280	3,760	3,880	8%
Light commercial equipment	2,230	2,780	3,060	3,270	47%
Locomotives	3,170	3,260	3,540	3,620	14%
Oil drilling equipment	20	20	20	20	0%
Pleasure craft	1,890	1,810	1,800	1,830	-3%
Portable equipment	4,830	6,240	6,700	6,970	44%
Recreational equipment	650	670	610	630	-3%
Transport Refrigeration Units	590	650	3,490	3,730	532%
Total Annual $MTCO_2e$	**34,160**	**36,290**	**42,840**	**54,010**	**58%**

* State modeling only provided emissions for commercial harbor equipment for 2019.

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

According to records maintained by the California Department of Conservation's Geologic Energy Management Division, there are no active oil or gas extraction wells in the unincorporated area. There are 16 natural gas storage wells in the hills between Clyde and Bay Point, along with an observation well. As these sites are not being used for active extraction, there are no further emissions associated with fossil fuel production at well sites in this inventory.

Water and Wastewater Emissions

Emissions associated with the water and wastewater sector are counted as indirect or direct emissions. Indirect water emissions refer to emissions created by the electricity required to treat and move water to where it is used. Indirect wastewater emissions refer to electricity needed to move wastewater to water treatment facilities, and to process and discharge it. Direct wastewater emissions refer to emissions produced directly by decomposing materials in wastewater.

GHG emissions from Contra Costa County's water and wastewater activity decreased 40 percent between 2005 and 2019. Indirect water GHG emissions declined by 62 percent between 2005 and 2019 while indirect wastewater GHG emissions decreased by 66 percent. Community members used substantially less water (31 percent less) and generated less wastewater (30 percent less) in 2019 than in 2005 despite population growth. This is likely a result of increased water efficiency by community residents and businesses. Additionally, the electricity used in water and wastewater pumping and treatment has been increasingly supplied by renewable and carbon-free sources, decreasing GHG emissions. Direct wastewater emissions did rise by approximately 199 percent from 2005 to 2019, but given that the amount of wastewater generated declined by this period, this is likely due to changes in modeling approaches and available data. The emissions data for the unincorporated area in **Table B-9** shows that overall emissions increased slightly within the water and wastewater sector.

TABLE B-9: WATER AND WASTEWATER ACTIVITY DATA AND GHG EMISSIONS BY SUBSECTOR, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005 – 2019
Activity Data					
Water use (million gallons)	11,530	11,650	7,380	8,010	-31%
Water electricity use (kWh)	26,443,770	28,004,290	19,137,620	20,783,930	-21%
Wastewater generation (million gallons)	4,560	4,610	3,150	3,170	-30%
Wastewater electricity use (kWh)	6,199,120	6,198,590	4,268,050	4,295,780	-31%
Emissions ($MTCO_2e$)					
Indirect water	5,960	5,470	1,840	2,250	-62%
Indirect wastewater	1,400	1,210	410	470	-66%
Direct wastewater	720	720	2,150	2,150	199%
Total Annual $MTCO_2e$	**8,080**	**7,400**	**4,400**	**4,870**	**-40%**

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

BART Emissions

Emissions associated with BART ridership decreased 82 percent between 2005 and 2019. This decline is attributable to changes in BART's electricity portfolio, which in recent years have shifted to favor more renewable and carbon-free sources of energy. BART ridership from community members in unincorporated Contra Costa County increased 29 percent between 2005 and 2019, as shown in **Table B-10**. Ridership at all stations serving the unincorporated area increased by 10 to 35 percent over this period except for Pittsburg/Bay Point, which saw some of its ridership shift to Pittsburg Center and Antioch with the opening of the BART to Antioch extension in 2018.

TABLE B-10: BART ACTIVITY DATA AND GHG EMISSIONS, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Activity Data					
BART Ridership (passenger miles)	11,231,870	14,228,420	15,528,840	14,444,740	29%
Emissions ($MTCO_2e$)					
Total Annual $MTCO_2e$	1,040	1,320	1,440	190	-82%
All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.					

Land Use and Sequestration

GHG emissions from land use and sequestration can be either positive (a source of emissions) or negative (removing emissions from the atmosphere, creating what is known as an emissions "sink"). Natural lands and trees in urban areas absorb carbon, storing it in wood, plants, and soil. As a result, when natural land is preserved or when more trees are planted, emissions from this sector are negative because GHGs are being removed from the atmosphere. However, developing natural lands or converting them to a different form (for example, replacing forests with crop land) or removing street trees causes carbon to be released, creating GHG emissions.

This sector includes emission sources and sinks from three types of activities: sequestration of GHG emissions in locally controlled forested lands, sequestration of GHG emissions in street trees in urbanized unincorporated areas, and emissions caused by permanently removing vegetation from natural lands or farmlands as a part of development.

Emissions and sequestered amounts remained constant in both years for all three activities. Locally-controlled forests and urban trees have not had their sequestration capabilities changed by human activities during the inventory period. While there was some development activity that caused a loss of sequestered GHG emissions, records of when the development specifically occurred are not available, and so the GHG emissions have been assigned equally to both inventory years, hence the lack of changes. Forests sequestered 58,110 $MTCO_2e$ annually, while urban trees sequestered 12,750 $MTCO_2e$, for a total carbon sink of 70,860 $MTCO_2e$ for the unincorporated area, as shown in **Table B-11**.

TABLE B-11: LAND USE AND SEQUESTRATION ACTIVITY DATA AND GHG EMISSIONS, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005 – 2019
Activity Data					
Acres of forested land	60,050	60,050	60,050	60,050	0%
Acres of urban trees	32,780	32,780	32,780	32,780	0%
Acres of land use changes	0	0	0	0	0%
Emissions ($MTCO_2e$)					
Forest sequestration	-58,110	-58,110	-58,110	-58,110	0%
Street tree sequestration	-12,750	-12,750	-12,750	-12,750	0%
Land use changes	0	0	0	0	0%
Total Annual $MTCO_2e$	**-70,860**	**-70,860**	**-70,860**	**-70,860**	**0%**

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

Wildfire

Wildfires create GHG emissions by burning organic materials such as trees and plants, releasing the carbon sequestered in these materials. Larger fires and those that burn through forested areas, as opposed to less densely vegetated ecosystems, release more GHG emissions. The County reported wildfires in the unincorporated area in 2005, 2013, and 2019, but not in 2017. The acreages and emissions of these fires for the unincorporated area are reported in **Table B-12**. Although wildfire emissions and acreages were lower in 2019 than in 2005, wildfire activity varies widely from year to year, and is generally expected to increase in future years due to climate change. Wildfire emissions are not calculated in the totals presented in this appendix and are for informational purposes only.

TABLE B-12: WILDFIRE ACTIVITY DATA AND GHG EMISSIONS, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Activity Data					
Acres burned	2,070	6,320	0	1,830	-31%
Emissions ($MTCO_2e$)					
Total Annual $MTCO_2e$	14,270	66,080	0	10,100	-29%

2005 wildfires: Bragdon Fire, BNSF Fire, Byron Fire, Vasco Airport Fire, and an unnamed fire south of Antioch.

2013 wildfires: Kirker Fire and Morgan Fire.

2019 wildfires: Marsh 3 Fire, Marsh 5 Fire, Marsh 6 Fire.

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

Stationary Source Emissions

Stationary source emissions result from fuel use, such as natural gas or propane, at large industrial facilities. These facilities include refineries, power plants, factories, and similar installations. Natural gas use at these facilities may be included as part of the nonresidential natural gas use reported by PG&E. These facilities are regulated by the State and BAAQMD, and the County does not have direct control over their operations. Emissions from these facilities are therefore not counted toward the County's total GHG emissions.

Table B-13 shows the emissions from stationary sources for the unincorporated area. This information is directly reported by the California Air Resources Board as total emissions. The Board does not report activity data for stationary sources, which would include amounts of fuel burned at these facilities. These emissions are not included in the totals presented in this memorandum and are for informational purposes only.

TABLE B-13: STATIONARY SOURCE GHG EMISSIONS, 2005–2019

Sector	2005	2013	2017	2019	Percentage Change, 2005–2019
Emissions ($MTCO_2e$)					
Total Annual $MTCO_2e$	13,983,030	11,956,000	11,232,290	10,867,670	-22%

All numbers are rounded to the nearest 10. Totals may not equal the sum of individual rows.

COUNTY OPERATIONS EMISSIONS

Sectors

The County operations inventory looks at GHG emissions from the following sectors:

- **Employee commute** includes GHG emissions from County employees commuting to and from work, as well as emissions associated with business travel.
- **Buildings and facilities** includes the electricity and natural gas use at County-owned facilities.
- **Government fleet** includes the fuel-use from County-owned vehicles.
- **Government-generated solid waste** includes the waste materials generated at County facilities.
- **Public lighting** includes the electricity use for publicly-owned lights, including streetlights and traffic signals.
- **Water and wastewater** includes emissions associated with water use and wastewater generation at County facilities.
- **Refrigerants** includes the leaks of GHGs from air conditioning systems in County-owned vehicles and buildings.

County Operations Inventory Results

In 2006, Contra Costa County government operations emissions totaled 54,090 $MTCO_2e$ for the sectors reported in this inventory, as shown in **Table B-14**. In 2017, County government operations GHG emissions were 43,380 $MTCO_2e$, a 20 percent decrease from 2006 levels. This decrease is primarily the result of reductions in energy use, reductions in County fleet emissions, and reductions in employee waste disposal. The 2017 inventory also includes emissions from wastewater treatment and refrigerants, which were not included in the 2006 inventory.

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TABLE B-14: 2006 BASELINE AND 2017 COUNTY-OPERATIONS GHG EMISSIONS SUMMARY

Sector	2006 GHG Emissions ($MTCO_2E$)	2017 GHG Emissions ($MTCO_2E$)	Percent Change
Employee commute	23,530	25,800	10%
Buildings and facilities	19,260	12,500	-35%
Government fleet	8,500	3,430	-60%
Government-generated solid waste	1,980	900	-54%
Public lighting	830	440	-47%
Water and wastewater	Not included	220	—
Refrigerants	Not included	90	—
Total	**54,090**	**43,380**	**-20%**

These inventories assume 8,420 County employees in 2006 and 10,030 employees in 2017, a 19% increase.

Note: All numbers are rounded to the nearest 10. Totals may not add up to the sum of individual rows due to rounding.

COUNTY OPERATIONS GHG INVENTORY RESULTS BY SECTOR

Employee Commute and Travel

Tables B-15 and B-16 summarize changes in 2006 and 2017 related to employee commute activities.

TABLE B-15: 2006 BASELINE AND 2017 EMPLOYEE COMMUTE AND TRAVEL EMISSIONS

Activity/Source	2006 $MTCO_2E$	2017 $MTCO_2E$	Percent Change
Employee commute	23,530	25,800	10%

TABLE B-16: 2017 EMPLOYEE COMMUTE ACTIVITY DATA AND GHG EMISSIONS

ACTIVITY/SOURCE	ACTIVITY DATA	UNITS	GHG EMISSIONS ($MTCO_2E$)	PERCENT
Driving alone (gas)	77,173,500	Vehicle miles	24,600	95%
Driving alone (electric)	4,494,570	Vehicle miles	0	0%
Carpool	1,155,500	Passenger miles	350	1%
Transit (BART, bus)	641,830	Passenger miles	100	Less than 1%
Motorcycle	425,050	Vehicle miles	749	3%
Active transportation (walk, bike)	66,590	Miles	0	0%
Telecommute	88,816	Miles	0	0%
Total	**84,045,860**	**Miles**	**25,800**	**100%**

Note: All numbers are rounded to the nearest 10. Totals may not add up to the sum of individual rows due to rounding.

Although employees' personal commute is not under the direct operational control of the County, there are a variety of tools and resources available to influence employees' commute patterns. For this reason, emissions are included in this inventory. Employee commute accounted for in the emissions inventory includes business travel; travel via personal vehicles; carpool; alternative transportation methods, including biking and walking; air travel; and public transit.

In 2017, County employees' commute to work contributed to 25,795 $MTCO_2e$. This is a 10 percent increase in GHG emissions from the 23,530 $MTCO_2e$ reported in 2006. Over the years, there was an increase in the number of employees from 8,420 to 10,030 between 2006 and 2017. Commute emissions reflect increased vehicle fuel efficiency, although changes in the number of employees and increases in commute distance balance that out.

Buildings and Facilities

The buildings and facilities sector includes electricity and natural gas use at County-owned and operated buildings and facilities. Emissions from this sector totaled 19,210 $MTCO_2e$ in 2006 and 12,500 $MTCO_2e$ in 2017 (see Table B-17), a 35 percent decrease.

TABLE B-17: 2006 BASELINE AND 2017 BUILDINGS AND FACILITIES ENERGY USE EMISSIONS

SUBSECTOR	2006 $MTCO_2E$	2017 $MTCO_2E$	PERCENT CHANGE
Buildings and facilities – natural gas	11,360	6,300	-44%
Buildings and facilities – electricity	7,670	6,200	-19%
Total	**19,030**	**12,500**	**-35%**
Note: All numbers are rounded to the nearest 10. Totals may not add up to the sum of individual rows due to rounding.			

Government (County) Fleet

The vehicles and equipment used in the County's daily operations burn gasoline, diesel, propane, and compressed natural gas fuel, resulting in the emission of GHGs.

Contra Costa's 2017 vehicle fleet emissions totaled 3,430 $MTCO_2e$ (see **Table B-18**). This is a 59-percent decrease in GHG emissions from the 8,500 $MTCO_2e$ in the 2006 inventory. This is primarily the result of a decrease in on-road vehicle miles traveled and an increase in fuel efficiency between inventory years.

TABLE B-18: 2006 BASELINE AND 2017 VEHICLE FLEET EMISSIONS

SECTOR	2006 $MTCO_2E$	2017 $MTCO_2E$	PERCENT CHANGE
Government fleet	8,500	3,430	-59%

Solid Waste

County operations generates solid waste during normal activity, much of which is eventually landfilled. Emissions from this sector are estimates of methane generation that will result in future years from the waste that was sent to the landfill in the inventory year. Solid waste generated by County employees contributed to a total of 900 $MTCO_2e$ in year 2017 (see **Table B-19**). Solid waste collected from County operations saw a reduction of 54 percent in emissions since the 2006 baseline, where this sector contributed to 1,980 $MTCO_2e$.

TABLE B-19: 2006 BASELINE AND 2017 GOVERNMENT-GENERATED SOLID WASTE

SECTOR	2006 $MTCO_2E$	2017 $MTCO_2E$	PERCENT CHANGE
Government-generated solid waste	1,980	900	-54%

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Public Lighting

Emissions from public lighting owned by the County, such as streetlights, totaled 440 $MTCO_2e$ in 2017 (see **Table B-20**). This is a 47-percent decrease from the 830 $MTCO_2e$ reported in 2006.

TABLE B-20: 2006 BASELINE AND 2017 PUBLIC LIGHTING

SECTOR	2006 MTCO2E	2017 MTCO2E	PERCENT CHANGE
Public lighting	830	440	-47%

Water and Wastewater

The water and wastewater treatment sector includes the emissions generated by the electricity needed to move and process the water used and the wastewater generated by County government facilities (indirect water and wastewater), along with direct emissions caused by the processing of County-generated wastewater. Water use and wastewater generation at County facilities generated a total of 220 $MTCO_2e$ in 2017 (see **Table B-21**). The water and wastewater sector was not included in the 2006 baseline inventory.

TABLE B-21: 2006 BASELINE AND 2017 WASTEWATER TREATMENT

SECTOR	2006 $MTCO_2E$	2017 $MTCO_2E$
Indirect Water	Not included	180
Indirect Wastewater	Not included	20
Direct Wastewater	Not included	20
Total	Not included	240
Note: All numbers are rounded to the nearest 10. Totals may not add up to the sum of individual rows due to rounding.		

Refrigerants

Vehicles and buildings with air conditioning use refrigerants that can leak from engines and appliances during normal operation and maintenance. These refrigerants are often GHGs that trap a very large amount of heat per unit of gas, known as gases with a very high global warming potential (GWP). Emissions from refrigerant leaks were accounted for in the 2017 GHG emissions inventory for County government operations. This sector was not included in the 2006 baseline inventory.

Refrigerant emissions contributed to 90 $MTCO_2e$ in 2017 (see **Table B-22**).

TABLE B-22: 2006 BASELINE AND 2017 REFRIGERANTS

SECTOR	2006 $MTCO_2E$	2017 $MTCO_2E$
Refrigerants	Not included	90

CONSUMPTION-BASED INVENTORY EMISSIONS

As discussed in Chapter 3, the consumption-based inventory accounts for GHG emissions created by the goods and services used by community members of the unincorporated county, including residents, businesses, and employees. A consumption-based inventory assesses emissions associated with the manufacture, transportation, and disposal of these goods and services, regardless of where they occur.

In 2015, BAAQMD worked with the Cool Climate Network at the University of California, Berkeley, to prepare a consumption-based inventory for all Bay Area jurisdictions. This inventory includes GHG emissions from the following sources:

- Travel: GHG emissions from fuel use by on-road vehicles, vehicle manufacturing and repairs, public transportation, and air travel.
- Housing: GHG emissions from electricity and natural gas use in homes as well as other fuels associated with home heating (such as kerosene or fuel oil), electricity emissions from water and wastewater activities, and waste emissions. This category also includes emissions from the manufacture, transportation, and construction and demolition of materials used to construct houses.
- Food: GHG emissions from the growth, processing/manufacturing, and transportation of food products.
- Goods: GHG emissions from the manufacture, transportation, and disposal of consumer products, such as home furnishings, appliances and electronics, clothing, and healthcare and personal items.
- Services: GHG emissions from personal and business services, including entertainment and recreation, communication, education, healthcare, and maintenance and repair activities.

Some of these GHG emission sources are also included in the production-based inventory prepared as part of the 2024 CAP, and others are covered by either the production-based or consumption-based inventory but not both. **Table B-23** compares the sources of GHG emissions in the 2024 CAP production-based inventory and the BAAQMD/Cool Climate Network consumption-based inventory.

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TABLE B-23 COMPARISON OF SOURCES IN PRODUCTION-BASED AND CONSUMPTION-BASED GHG EMISSION INVENTORIES

Source of Emissions	Production-Based CAP Inventory	BAAQMD/Cool Climate Network Consumption-Based Inventory
Generation of electricity used	Included	Included
Combustion of natural gas used	Included	Included
Combustion of other home heating fuels used	Not included	Included
Fuel use from on-road vehicles	Included	Included
Fuel use from public transportation	Included	Included
Electricity use from BART	Included	Included
Vehicle manufacturing and repairs	Partially included*	Included
Air travel	Not included	Included
Fuel use from off-road equipment, including construction and landscaping equipment	Included	Not included
Generation of electricity used for water processing and transportation	Included	Included
Generation of electricity used for wastewater processing and transportation	Included	Unknown†
Direct wastewater process emissions	Included	Not included
Landfilling of solid waste	Included	Included
Reprocessing of recyclables	Partially included*	Included
Compost processing	Partially included*	Included
Manufacturing of home-construction materials	Partially included*	Included
Food growth, processing, production, and transportation	Partially included*	Included
Carbon sequestration in forests and street trees	Included	Not included
Other embedded emissions in goods and services	Not included	Included

Note: Due to differences in data sources and analysis methods, the same source of emissions in both inventories may produce different results.

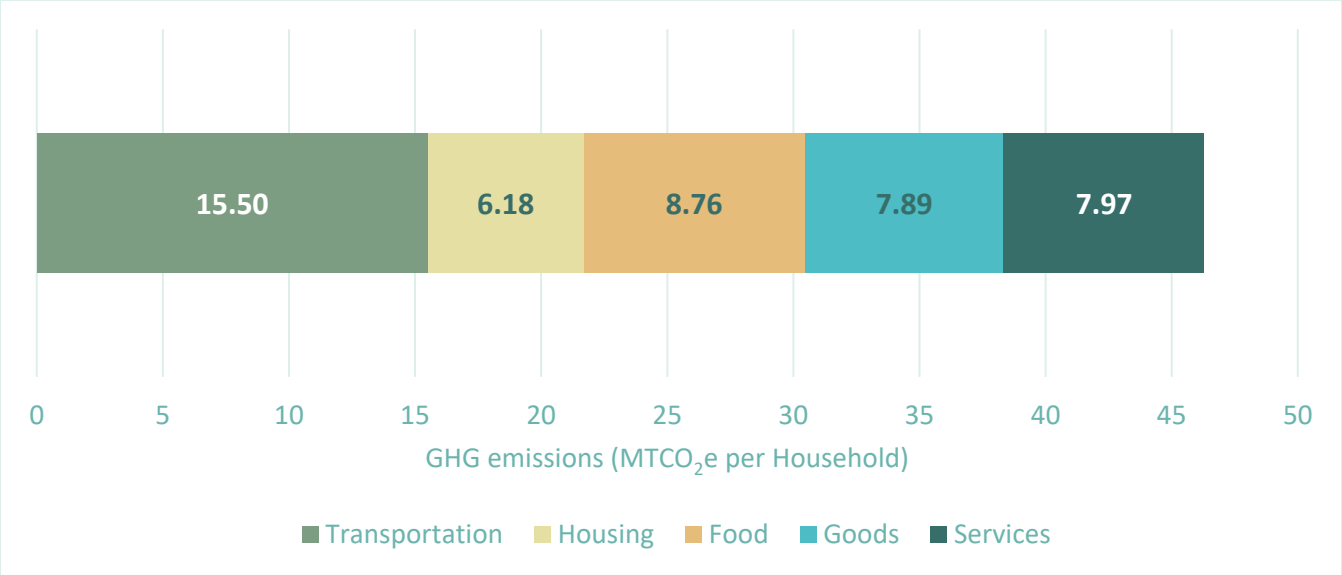
* Emissions from energy use, water use, and waste generation associated with these activities are included in the 2024 CAP Update inventory if these activities occur in Contra Costa County. Emissions from these activities outside of Contra Costa County and other emissions associated with these activities in Contra Costa County are not included in the 2024 CAP inventory.

† Emissions from these activities are not explicitly called out in the BAAQMD/Cool Climate Network consumption-based inventory but may be included in the total electricity use category.

Due to differences in data sources and analysis methods, the same source of emissions in both inventories may produce different results.

According to the consumption-based inventory, transportation is responsible for 34 percent of emissions produced by activities conducted and good consumed within unincorporated Contra Costa County. Food is responsible for 19 percent, goods and services for 17 percent each, and housing for 13 percent (see **Figure B-1**).

FIGURE B-1. CONSUMPTION-BASED INVENTORY RESULTS



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Community-Wide Forecast

The forecast of community-wide GHG emissions for the unincorporated area is based on the results of the 2019 community GHG emissions inventory. The project team assumed growth in these emissions consistent with the anticipated growth in unincorporated Contra Costa County's future population, jobs, and development patterns, developed as part of the Envision Contra Costa buildout calculations. The project team forecast GHG emissions for the calendar years 2030 and 2045. The forecast is a "worst case" scenario that does not assume any efforts are taken, at any level, to reduce GHG emissions beyond the policies that are already in effect in 2019.

For many sectors, the GHG forecast assumes that each person in the unincorporated area will continue to contribute the same amount of GHG emissions as they did in 2019, so that the amount of GHG emissions increases proportionally to demographic growth. There are some sectors that are not projected this way:

- Transportation, which is projected using a regional traffic demand model based partially on demographics and partially on the location of various land uses.
- Agriculture, which is forecast using future land use projections for the amount of agricultural land in the unincorporated area.
- Land use and sequestration, which is forecast using future land use projections for developed land, forested land, and any agricultural and open space land that is developed.
- Within the off-road equipment sector, emissions from construction and mining equipment are projected using the rate of population and job growth, emissions from industrial equipment are projected using future land use projections for industrial land, and emissions from Transportation Refrigeration Units are projected using the proportion of county-wide road miles in the unincorporated area.

The forecast does not project any change in activity or GHG emissions for alternative home heating fuels (propane, kerosene, and wood), direct access electricity, cargo-handling equipment, or oil drilling equipment. Additionally, emissions for the two informational sectors (stationary sources and wildfires) are not forecasted, owing to their informational and substantial uncertainty in projecting future activities for these sectors. These GHG emissions do not have a demographic indicator that staff can use to reasonably project the volume of these emissions in the future, particularly given that they are informational

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items and not included in the total community-wide emissions. **Table B-23** shows the demographic projections and their sources for the unincorporated area.

TABLE B-23: DEMOGRAPHIC PROJECTIONS, 2019 – 2045

Demographic	2019	2030	2045	Percentage Change, 2019-2045	Source
Population	174,150	199,360	239,720	38%	ABAG/MTC, Envision Contra Costa
Households	60,320	69,210	83,500	38%	ABAG/MTC, Envision Contra Costa
Jobs	38,760	42,480	48,150	24%	US Census Bureau, Envision Contra Costa
Service population*	212,910	241,840	287,870	35%	ABAG/MTC, US Census Bureau, Envision Contra Costa

* Service population is the sum of population and jobs

All numbers are rounded to the nearest 10.

Table B-24 shows unincorporated Contra Costa County's projected future GHG emissions relative to the 2019 inventory. Most sectors show an increase in GHG emissions due to the growing population. Agricultural emissions decrease because the amount of land use for agricultural purposes is projected to decline. Although the land use and sequestration sector is expected to remain a net carbon sink (negative emissions), the amount of emissions sequestered (removed from the atmosphere) by the activities in this sector are projected to decline. This is due to anticipated development of currently undeveloped land, removing the potential for this land to sequester carbon. Sequestration in forested and urbanized areas is projected to increase slightly.

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TABLE B-24: ABSOLUTE GHG EMISSIONS FORECAST, 2019–2045

Sector	2019 $MTCO_2E$	2030 $MTCO_2E$	2045 $MTCO_2E$	Percentage Change, 2019–2045
Transportation	464,040	542,020	605,080	30%
Residential energy	191,780	217,710	259,380	35%
Nonresidential energy	159,520	167,720	180,200	13%
Solid waste	220,760	229,450	260,490	18%
Agriculture	36,130	34,770	33,410	-8%
Off-road equipment	54,010	69,520	76,100	41%
Water and wastewater	4,870	5,530	6,590	35%
BART	190	220	260	37%
Land use and sequestration	-70,860	-67,580	-58,890	-17%
Total Annual $MTCO_2e$	1,060,440	1,199,360	1,362,620	**28%**
All values rounded to the nearest 10. Due to rounding, totals may not equal the sum of the individual values.				

Quantification

STATE AND REGIONAL GHG EMISSION REDUCTIONS FROM EXISTING ACTIONS

California has adopted and is committed to implementing policies that reduce statewide GHG emissions, including those in Contra Costa County. Many of these policies are laid out in the Climate Change Scoping Plan (Scoping Plan), a state document that outlines regulatory and market-based solutions to achieving California's GHG emission reduction goals. The Scoping Plan was first prepared in 2008, with successive updates in 2014, 2017, and 2022. These updates revised the state-level actions and identified additional opportunities for GHG emission reductions.

The Scoping Plan and related documents lay out several policies to reduce California's GHG emissions, although not all are directly applicable to Contra Costa County. The project team has assessed Contra Costa County's GHG emissions and identified five state policies that are direclty relevant to the community. This allows the 2024 CAP to provide "credit" to Contra Costa County for these policies. These state efforts are:

- **The Renewables Portfolio Standard (RPS)**, which requires increases in renewable and carbon-free electricity supplies. RPS was first established in 2002 and has been amended multiple times, most recently by SB 100 in 2018. It requires all electricity providers in the state to obtain at least 33 percent of their electricity from eligible renewable resources by the end of 2020, 60 percent of their electricity from eligible renewable resources by the end of 2030, and all of their electricity from carbon-free (although not necessarily eligible renewable) resources by the end of 2045. This policy reduces GHG emission from electricity use, including electricity used to transport and process water and wastewater, and electricity used for electric vehicles.
- **The Clean Car Standards,** which require increased fuel efficiency of on-road vehicles and decreased carbon intensity of vehicle fuels. In 2002, California adopted AB 1493, the New Passenger Motor Vehicle Greenhouse Gas Emission Standards or Pavley standard. It required a reduction in tailpipe GHG emissions from new vehicles produced from 2009 to 2015. In 2012 CARB adopted an extension of this policy, the Advanced Clean Car Standards, which requires more stringent reductions in tailpipe GHG emissions from vehicles produced from 2016 to 2025. The Clean Car Standards reduce GHG emissions from on-road transportation. In August 2022, CARB adopted another expansion of these standards, known as the Advanced Clean Cars II standards. This regulation requires that all new light-duty vehicles (e.g., passenger cars, small trucks, and SUVs) sold in the state to be zero-emission by 2035, with interim targets for new light-duty vehicle sales beginning in 2026. There are some limited exceptions for plug-in hybrid vehicles. CARB adopted similar rules for heavy-duty vehicles and state and local government fleets in 2020 (Advanced Clean Trucks) and 2023 (Advanced Clean Fleets). Advanced Clean Cars II and Advanced Clean Fleets are not included in the modeling used to assess GHG reductions from the Clean Car Standards. These GHG reductions are counted as part of the reductions associated with Strategy TR-2.
- **The updated Title 24 building energy efficiency standards** require new buildings to achieve increased energy-efficiency targets. The latest version of these standards is set to go into effect January 1, 2023. California Code of Regulations, Title 24, Part 6 is California's energy efficiency standards for new and renovated buildings, applied at the local level through the project review and building permit process. The standards are strengthened every three years, with the ultimate goal of making new buildings net-zero energy, meaning that they would generate as much energy as they use. The most recent set of Title 24 standards went into effect on January 1, 2020. On August 11, 2021, the California Energy Commission (CEC) adopted the 2022 Title 24 standards. In December, it was approved by the California Building Standards Commission for

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inclusion into the California Building Standards Code. The 2022 Title 24 standards encourage efficient electric heat pumps, establish electric-ready requirements for new homes, expand solar photovoltaic and battery storage standards, and strengthen ventilation standards. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Title 24 standards.

The Low Carbon Fuel Standard (LCFS) mandates reduced carbon intensity of fuels used in off-road equipment. The Low Carbon Fuel Standard was adopted in 2009 and required a 10 percent reduction in the carbon intensity of all transportation and equipment fuels by 2020. This policy reduces GHG emissions from on-road transportation and from off-road equipment. The LCFS has since been revised several times, most recently in 2020. The 2020 LCFS requires further reductions in carbon intensity of around 1.25 percent every year until 2030.

- **The Short-Lived Climate Pollutant Reduction Strategy**, also known as Senate Bill (SB) 1383, requires that communities divert 75 percent of organic waste (food scraps, grass, and plant trimmings, etc.) away from landfills and toward alternatives such as composting or energy generation. As a part of this requirement, all jurisdictions must offer curbside composting to single-family and small multifamily properties (less than five units). Larger multifamily properties and businesses must either participate in curbside composting or subscribe to self-haul organic waste to a composting program or collection site. SB 1383 also includes requirements related to diverting surplus food to people in need, increasing the use of products made from recycled organics, and providing more detailed reporting statistics.
- **Renewable Natural Gas** assumes that biomethane and renewable hydrogen fuels will be blended into the fossil gas pipeline and that, in the 2030s, dedicated hydrogen pipelines will be constructed to serve certain industrial clusters.

In addition to these five state-level policies, the County's default electricity provider, MCE, has also taken action to reduce the GHG emissions from the electricity it supplies to Contra Costa community members, beyond the minimum required by RPS. In 2019, MCE electricity was approximately 60 percent renewable and 90 percent carbon-free. In 2023, MCE sourced over 95 percent of its electricity from carbon-free sources. Since MCE supplies more electricity from carbon-free sources than RPS requires it to, the County can receive "credit" for the GHG reductions that result from going beyond the State mininum.

Overall, these existing policies are expected to reduce Contra Costa County's future GHG emissions. Without these policies in place, community-wide GHG emissions in the unincorporated area are expected to be approximatley 1,300,320 $MTCO_2e$ by 2045, or 29

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percent above 2019 levels. With these polices enacted, community-wide GHG absolute emissions in the unincorporated area are projected to be approximately 836,100 $MTCO_2e$ by 2045, or 17 percent below 2019 levels. **Table B-25** shows the absolute reductions achieved by these policies.

TABLE B-25: ABSOLUTE GHG EMISSIONS WITH EXISTING ACTIONS (2019–2045)

	2019	2030	2045	Percentage Change, 2019–2045
Forecast emissions without state and regional actions	1,060,440	1,199,360	1,362,620	28%
Reductions from RPS	-	-24,620	-115,400	-
Reductions from Clean Car standards	-	-110,250	-214,120	-
Reductions from Title 24	-	10,460	33,710	-
Reductions from LCFS (off-road only)*	-	-740	-7,430	-
Reductions from SB 1383	-	-21,880	-53,870	-
Reductions from renewable natural gas		17,810	73,670	
Reductions from MCE clean energy procurement	-	-1,240	-	-
Reductions from all actions	**-**	**-185,520**	**-483,340**	**-**
Emissions with state and regional actions	**1,060,440**	**1,013,840**	**879,280**	**-17%**

Note: All numbers are rounded to the nearest 10. Due to rounding, totals may not equal the sum of the individual values.

* Due to the methods used in the forecast and assessment of state GHG reduction potential, future projections for off-road equipment GHG emissions are higher than forecast above.

TECHNICAL DATA FOR GHG REDUCTION STRATEGIES

This section discusses the data sources, methods, and assumptions for the quantification of the GHG-reduction strategies included in the Contra Costa County 2024 CAP. In addition to the sources presented here, these calculations also rely on the GHG inventory and forecast. These calculations rely on emission factors that reflect the reductions already achieved by the existing actions discussed in the previous section. **Table B-26** shows these emission factors.

TABLE B-26: EMISSION FACTORS WITH EXISTING ACTIONS (2019–2045)

Activity Type	Units	2019	2030	2045
Electricity (PG&E)	$MTCO_2e$/kWh	0.000108	0.000077	0.000000
Electricity (MCE)	$MTCO_2e$/kWh	0.000045	0.000044	0.000000
Electricity (direct access)	$MTCO_2e$/kWh	0.000187	0.000134	0.000000
Electricity (PG&E and MCE)	$MTCO_2e$/kWh	0.000054	0.000047	0.000000
Natural gas	$MTCO_2e$/Therms	0.005310	0.005311	0.005310
Propane	$MTCO_2e$/Gallons	0.005845	0.005845	0.005845
Kerosene	$MTCO_2e$/Gallons	0.010417	0.010417	0.010417
Wood	$MTCO_2e$/MMBTU	0.095664	0.095664	0.095664
On-road transportation	$MTCO_2e$/VMT	0.000408	0.000325	0.000408
Solid waste (MSW)	$MTCO_2e$/Tons	0.261659	0.261678	0.261676
Solid waste (ADC)	$MTCO_2e$/Tons	0.245383	0.245132	0.245854
Solid waste (combined)	$MTCO_2e$/Tons	0.004628	0.003958	0.260191
BART	$MTCO_2e$/Passenger miles	0.000013	0.000008	0.000013

For each strategy, this appendix discusses the following items:

- The savings in activity data (e.g., kWh of electricity or tons of solid waste) in 2030 and 2045 resulting from implementing the strategy as described. A negative value indicates an increase in activity data.
- The decreases in GHG emissions in 2030 and 2045 resulting from implementing the strategy as described.
- The assumptions made about the strategy's performance, such as the level of community participation required to achieve the specified reductions by 2030 and 2045.
- The performance targets, which are quantifiable metrics about the projected level of success the strategy must meet to achieve the specified reductions by 2030 and 2045.
- Sources: Key studies, analyses, and other sources of data used to inform the quantification. This does not include the GHG inventory, forecast, or other technical analyses prepared as part of the 2024 CAP or the 2045 Contra Costa General Plan.

CLEAN AND EFFICIENT BUILT ENVIRONMENT

Strategy BE-1: Require and incentivize new buildings and additions built in unincorporated Contra Costa County to be low-carbon or carbon neutral.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Natural gas savings (therms)	2,608,380	2,616,320
Electricity savings (kWh)	-5,048,670	-5,151,330

GHG SAVINGS

	2030 $MTCO_2E$	20545$MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	13,620	11,120

KEY ASSUMPTIONS

	2030	2045
Cumulative percent of residential new construction built to be all-electric	95%	95%
Cumulative % of new office construction built to be all-electric	80%	95%
Cumulative % of new non-office commercial construction built to be all-electric	75%	90%
Cumulative % new non-residential buildings that are office space:	20%	20%

PERFORMANCE TARGETS

	2030	2045
Number of new all-electric residential units	8,450	22,020
Number of new all-electric commercial buildings	220	580

SOURCES

American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). 2015. "ASHRAE Technical FAQ".

California Energy Commission. 2006. *2006 California Commercial End-Use Survey (CEUS)*. https://www.energy.ca.gov/datB-reports/surveys/californiB-commercial-end-use-survey/2006-californiB-commercial-end-use-survey.

California Energy Commission. 2021. *2019 California Residential Appliance Saturation Study (RASS)*. https://www.energy.ca.gov/datB-reports/surveys/2019-residential-appliance-saturation-study.

Strategy BE-2: Retrofit existing buildings and facilities in the unincorporated County, and County infrastructure, to reduce energy use and convert to low-carbon or carbon-neutral fuels.

In March 2023, BAAQMD adopted amendments to Regulation 9, Rules 4 and 6. These revisions require that, when existing natural-gas-powered space heaters and water heaters reach the end of their operational life, they be replaced with electric-powered models. These requirements are scheduled to take effect in 2027 to 2031 for water heaters (depending on the capacity of the unit) and in 2029 for space heaters.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Electricity savings (kWh) – With BAAQMD rule	85,410,090	136,786,980
Natural gas savings (therms) – With BAAQMD rule	13,853,380	39,917,870
Propane savings (gallons) – With BAAQMD rule	404,380	838,540
Gallons kerosene	2,090	5,500
MMBTU wood	13,010	34,300

GHG SAVINGS

With BAAQMD rule	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	81,140	177,830

KEY ASSUMPTIONS

	2030	2045
Percent of existing homes conducting standard retrofits	20%	40%
Percent of existing homes upgrading to Title 24 Standards	20%	40%
Percent of existing mobile homes conducting standard retrofits	30%	60%
Percent of businesses conducting standard retrofits (not including fuel switching)	15%	25%
Percent of businesses retrofitting to current Title 24 standards (not including fuel switching)	15%	25%
Cumulative percent of existing commercial buildings eligible for fuel switching	40%	40%
Cumulative percent of residential cooktops and clothes dryers undergoing fuel switching	5%	60%
Cumulative percent of residential water and space heaters undergoing fuel switching	40%	95%
Cumulative percent of commercial cooktops and clothes dryers undergoing fuel switching	5%	50%
Cumulative percent of commercial water and space heaters undergoing fuel switching	40%	95%
Average number of newly electric appliances in units or commercial buildings undergoing electrification	2	4

PERFORMANCE TARGETS

	2030	2045
Number of housing units undergoing energy efficiency retrofits	14,160	28,310
Number of housing units brought up to current Title 24 energy efficiency standards	13,210	26,430
Number of commercial buildings undergoing energy efficiency retrofits	490	820
Number of commercial buildings brought up to current Title 24 energy efficiency standards	490	820
Number of existing residential units electrifying appliances	9,850	33,000
Number of existing commercial buildings electrifying appliances	100	620

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California Energy Commission. 2006. *2006 California Commercial End-Use Survey (CEUS)*. https://www.energy.ca.gov/datB-reports/surveys/californiB-commercial-end-use-survey/2006-californiB-commercial-end-use-survey.

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US Department of Energy. n.d. "Energy-Efficient Manufactured Homes." https://www.energy.gov/energysaver/energy-efficient-manufactured-homes.

Strategy BE-3: Increase the amount of electricity used and generated from renewable sources in the county.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Electricity savings (kWh)	114,969,980	271,666,080

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	10,820	0

KEY ASSUMPTIONS

	2030	2045
Percent of existing homes installing solar energy systems	15%	35%
Percent of existing homes with solar energy systems and installing battery storage systems	20%	50%
Percent of new homes installing battery storage systems	40%	60%
Percent of existing businesses installing solar energy systems	3%	11%
Percent of existing businesses with solar energy systems and battery storage systems	15%	45%
Percent of residents enrolling in MCE	90%	90%
Percent of businesses enrolling in MCE	90%	90%
Percent of residents enrolling in 100% renewable tiers	10%	30%
Percent of businesses enrolling in 100% renewable tiers	5%	20%
Percent of direct access customers switching to MCE	5%	10%

PERFORMANCE TARGETS

	2030	2045
Residential solar systems installed	9,190	23,030
Residential battery systems installed	5,330	0
Nonresidential solar systems installed	30	290
Nonresidential battery systems installed	10	0
Residential electricity supplied by MCE (kWh)	271,041,850	291,475,310
Residential electricity provided at Deep Green tier (kWh)	25,732,490	83,017,260
Nonresidential electricity provided by MCE (kWh)	219,158,600	220,222,390
Nonresidential electricity provided at Deep Green tier (kWh)	10,521,500	42,290,280

SOURCES

California Distributed Generation Statistics. 2021. Interconnected Project Sites, 2021-09-30 [data set]. https://www.californiadgstats.ca.gov/archives/interconnection_rule21_projects/.

MCE. 2020. *Operational Integrated Resource Plan, 2021- 2030*. https://www.mcecleanenergy.org/wp-content/uploads/2020/10/MCE-Operational-Integrated-Resource-Plan_2021.pdf.

National Renewable Energy Laboratory. n.d. "PVWatts". https://pvwatts.nrel.gov/.

NO WASTE CONTRA COSTA

Strategy NW-1: Increase composting of organic waste.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Waste savings (tons)	5,580	9,190

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	2,240	4,000

KEY ASSUMPTIONS

	2030	2045
Current compost diversion rate	77%	77%
Target compost diversion rate	90%	95%

PERFORMANCE TARGETS

	2030	2045
Number of households with composting service	62,290	79,330
Number of businesses with composting service	2,930	3,510

SOURCES

California Air Resources Board. 2011. Landfill Methane Emissions Tool [data table]. https://ww2.arb.ca.gov/resources/documents/landfill-methane-emissions-tool.

California Department of Resources Recycling and Recovery. 2019. "Residential Waste Stream by Material Type". https://www2.calrecycle.ca.gov/WasteCharacterization/ResidentialStreams?lg=7&cy=7.

California Department of Resources Recycling and Recovery. 2019. "Waste Characterization Tool for California Jurisdictions". https://www2.calrecycle.ca.gov/WasteCharacterization/.

Contra Costa County. 2020. *Climate Action Plan Progress Report for 2020*. https://www.contracosta.ca.gov/AgendaCenter/ViewFile/Agenda/_12142020-3083.

Strategy NW-2: Reduce waste from County operations.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Waste savings (tons)	2,630	3,510

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	1,090	1,620

KEY ASSUMPTIONS

	2030	2045
Target composting diversion rate for County activities	85%	95%
Target recycling diversion rate for County activities	85%	95%

PERFORMANCE TARGETS

	2030	2045
Weekly average cubic yards of composted organics (uncompacted)	1,050	1,140
Weekly average cubic yards of recycled materials (uncompacted)	270	300

SOURCES

California Air Resources Board. 2011. Landfill Methane Emissions Tool [data table]. https://ww2.arb.ca.gov/resources/documents/landfill-methane-emissions-tool.

California Department of Resources Recycling and Recovery. 2019. "Residential Waste Stream by Material Type." https://www2.calrecycle.ca.gov/WasteCharacterization/ResidentialStreams?lg=7&cy=7.

California Department of Resources Recycling and Recovery. 2019. "Waste Characterization Tool for California Jurisdictions". https://www2.calrecycle.ca.gov/WasteCharacterization/.

Intergovernmental Panel on Climate Change. 2006. "2006 IPCC Guidelines for National Greenhouse Gas Inventories." https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html.

Strategy NW-3: Increase community-wide recycling and waste programs.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Waste savings (tons)	5,560	16,770

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	520	2,530

KEY ASSUMPTIONS

	2030	2045
Target community diversion rate	77%	85%
Decrease in non-organic and non-recyclable waste tonnage	20%	50%

PERFORMANCE TARGETS

	2030	2045
Reduction in landfilled recyclables (tons)	0	1,280
Decrease in non-compostable/recyclable tonnage (tons)	5,560	15,490
Pounds of waste per person per day	2.08	1.85

SOURCES

California Air Resources Board. 2011. Landfill Methane Emissions Tool [data table]. https://ww2.arb.ca.gov/resources/documents/landfill-methane-emissions-tool.

California Department of Resources Recycling and Recovery. 2019. "Residential Waste Stream by Material Type". https://www2.calrecycle.ca.gov/WasteCharacterization/ResidentialStreams?lg=7&cy=7.

California Department of Resources Recycling and Recovery. 2019. "Waste Characterization Tool for California Jurisdictions". https://www2.calrecycle.ca.gov/WasteCharacterization/.

United States Environmental Protection Agency. 2016. *Volume-to-Weight Conversion Factors*. https://www.epa.gov/sites/default/files/2016-04/documents/volume_to_weight_conversion_factors_memorandum_04192016_508fnl.pdf.

REDUCE WATER USE AND INCREASE DROUGHT RESILIENCE

Strategy DR-1: Reduce indoor and outdoor water use.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Electricity savings (kWh)	1,436,210	2,560,780
Water (MG)	360	650

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	970	1,440

KEY ASSUMPTIONS

	2030	2045
Percent of existing homes with graywater systems	5%	20%
Percent of existing businesses with graywater systems	2%	10%
Percent of existing homes retrofitting water fixtures	60%	90%
Percent of existing businesses retrofitting water fixtures	60%	90%
Percent of new homes with graywater systems	10%	35%
Percent of new businesses with graywater systems	5%	20%

DRAFT

PERFORMANCE TARGETS

	2030	2045
Number of residential graywater system installations	3,910	20,180
Number of commercial graywater systems installations	70	440
Number of nonresidential buildings receiving water efficiency upgrades	1,790	2,680
Number of residential buildings receiving water efficiency upgrades	36,190	54,290

SOURCES

Environmental Protection Agency. 2009. "Water Efficiency in the Commercial and Institutional Sector: Considerations for a WaterSense Program." https://www.epa.gov/sites/default/files/2017-03/documents/ws-commercial-ci-whitepaper.pdf

State of California, Natural Resources Agency, Department of Water Resources. 2014. "California Water Plan Update 2013."

State of California, Natural Resources Agency, Department of Water Resources. 2019. "California Water Plan Update 2018." https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/CaliforniB-Water-Plan/Docs/Update2018/Final/CaliforniB-Water-Plan-Update-2018.pdf

Water Research Foundation. 2016. "Residential End Uses of Water Study, Version 2: Executive Report."

Strategy DR-2: Ensure sustainable and diverse water supplies.

This is a supportive measure that does not result in direct measureable GHG emissions. There are no activity or GHG savings, assumptions, performance indicators, or sources associated with this measure.

DRAFT

CLEAN TRANSPORTATION NETWORK

Strategy TR-1: Improve the viability of walking, biking, zero-emission commuting, and using public transit for travel within, to, and from the county.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Vehicle Miles Traveled (VMT)	52,447,950	153,067,310

GHG SAVINGS

	2030 $MTCO_2E$	20545$MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	17,050	40,370

KEY ASSUMPTIONS

	2030	2045
Miles of bicycle lanes	45	132
Average round trip length for bicyclee trips (miles)	2.1	2.1
Is bike parking provided in most nonresidential locations?	Yes	Yes
% increase in combined housing units/acre due to TOD	15%	63%
% increase in jobs/acre due to TOD	10%	45%
Percent increase in transit frequency	5%	15%
Level of implementation (increase in transit frequency)	10%	25%
Percent increase in transit service miles	5%	15%
Percent of employers participating in TDM	5%	20%
Average trip reduction from voluntary TDM participation	15%	45%
Percent of county with expanded sidewalks	5%	15%
Change in percent of households that have access to electric bike sharing	5%	9%
Percent of multifamily units permanently designated as affordable	5%	15%
Percent of transit routes that receive supportive treatments	1%	2%

PERFORMANCE TARGETS

	2030	2045
Miles of bicycle lanes	50	130
Bicycle mode share	1%	1%
Bus ridership (commute share)	5%	15%
BART ridership (passenger miles)	17,227,850	22,459,900
VMT reduction from TDM programs	1,705,370	25,757,280
New affordable multifamily units	70	540
Percent of transit routes that receive supportive treatments	1%	2%
Change in percent of households that have access to electric bike sharing	5%	9%

SOURCES

California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures." http://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoB-quantifying-greenhouse-gas-mitigation-measures.pdf.

Contra Costa Transportation Authority. 2018. "Contra Costa Countywide Bicycle Pedestrian Plan." https://ccta.net/wp-content/uploads/2018/10/5b8ec26192756.pdf.

US Census. "Contra Costa County 2019 ACS 5-Year Estimates, Table B08006."

Strategy TR-2: Increase the use of zero-emissions vehicles. Transition to a zero-emission County fleet by 2035 and a community fleet that is at least 50 percent zero-emission by 2030.

ACTIVITY DATA SAVINGS

Activity Data Type	2030	2045
Electricity used (kWh)	-111,003180	-253,986,510
Natural gas (gallons)	2,760	5,450
Diesel (gallons)	530,690	1,353,420
VMT	14,260	14,260

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	130,160	329,360

KEY ASSUMPTIONS

	2030	2045
Percent of county vehicles that are zero-emission	80%	95%
Percent of community fleet that is zero-emission (light-duty)	35%	85%
Target percent of total community TNC VMT from electric vehicles	75%	90%
Percent of community fleet that is zero-emission (heavy-duty)	10%	70%
Target percent total commercial Natural Gas VMT replaced by biomethane	2%	5%
Target percent total commercial Diesel VMT replaced by biomethane	5%	15%
Percent of lawn and garden fuel use converted to electric	30%	80%
Percent construction equipment fuel use converted to electric	30%	60%
Percent other commercial fuel use converted to electric	20%	55%
Number of EVs in EV car sharing	50	100

PERFORMANCE TARGETS

	2030	2045
New VMT from electric vehicles, community-wide	325,676,160	950,943,040
Reduction in municipal vehicle gasoline use (gallons)	230,120	250,030
New VMT from electric vehicles, TNC	82,961,910	101,629,820
Reduction in offroad gasoline use (gallons)	2,113,740	0
Reduction in offroad diesel use (gallons)	3,625,240	0
Increase in biomethane VMT	3,003,670	8,050,840
Number of EVs in car sharing	50	100

SOURCES

California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures." http://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoB-quantifying-greenhouse-gas-mitigation-measures.pdf.

California Air Resources Board. 2010. "Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories." https://ww3.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

California Air Resources Board. 2020. "2020 Emissions Model for Small Off-Road Engines – SORE2020." https://ww2.arb.ca.gov/sites/default/files/2020-09/SORE2020_Technical_Documentation_2020_09_09_Final_Cleaned_ADA.pdf.

California Air Resources Board. 2021. "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity." https://www.airquality.org/ClimateChange/Documents/Handbook%20Public%20Draft_2021-Aug.pdf.

California Air Resources Board. 2021. EMFAC2021 V1.0.1 Emission Inventory. https://arb.ca.gov/emfac/emissions-inventory/.

Contra Costa Transportation Authority. 2018. "Contra Costa Countywide Bicycle Pedestrian Plan." https://ccta.net/wp-content/uploads/2018/10/5b8ec26192756.pdf.

Contra Costa Transportation Authority. 2019. "Contra Costa Electric Vehicle Readiness Blueprint." https://ccta.net/wp-content/uploads/2019/07/CCTB-EV-Blueprint.pdf.

US Department of Energy. 2021. "FuelEconomy.gov". https://fueleconomy.gov/.

RESILIENT COMMUNITIES AND NATURAL INFRASTRUCTURE

Strategy NI-4: Sequester carbon on natural and working lands in Contra Costa County.

ACTIVITY DATA SAVINGS

There are no activity data savings associated with this strategy.

GHG SAVINGS

	2030 $MTCO_2E$	2045 $MTCO_2E$
GHG reduction (Absolute $MTCO_2e$)	22,630	88,910

DRAFT

KEY ASSUMPTIONS

	2030	2045
Percent of irrigated crops with seasonal cover crops	15%	35%
Percent of irrigated crops practicing mulching	5%	35%
Percent of irrigated crops with compost application	15%	80%
Percent of irrigated crops with field borders	2%	8%
Percent of irrigated crops practicing alley cropping	10%	30%
Percent of irrigated crops with conservation crop rotation	25%	50%
Percent of irrigated crops practicing reduced tillage	15%	35%
Percent of irrigated crops practicing no tillage	5%	10%
Percent of orchards/vineyards with seasonal cover crops	5%	25%
Percent of orchards/vineyards practicing mulching	5%	25%
Percent of orchards/vineyards with compost application	15%	80%
Percent of orchards/vineyards with windbreaks	0%	2%
Percent of orchards with reduced tilling	10%	35%
Percent of vineyards with reduced tilling	10%	35%
Percent of pastures and rangeland with compost application	5%	15%
Percent of pastures and rangeland with prescribed grazing	15%	40%
Percent of pastures and rangeland practicing oak restoration	1%	5%
Percent of pastures and rangeland practicing riparian restoration	0%	1.2%
Percent of rangeland with range planting	2%	10%
Percent of grasslands with native grass restoration	2%	10%
Percent of forested areas undergoing annual fuel reduction	5%	25%

PERFORMANCE TARGETS

	2030	2045
Acres of irrigated crops with seasonal cover crops	3,770	8,130
Acres of irrigated crops practicing mulching	1,260	8,130
Acres of irrigated crops with compost application	3,770	18,590
Acres of irrigated crops with field borders	500	1,860
Acres of irrigated crops converted due to alley cropping	510	1,480
Acres of irrigated crops with conservation crop rotation	6,280	11,620
Acres of irrigated crops practicing reduced tillage	3,770	8,130
Acres of irrigated crops practicing no tillage	1,260	2,320
Acres of orchards or vineyards with seasonal cover crops	220	1,060
Acres of orchards or vineyards practicing mulching	220	1,060
Acres of orchards or vineyards with compost application	660	3,380
Acres of orchards or vineyards with windbreaks	-	80
Acres of orchards with reduced tilling	250	790
Acres of vineyards with reduced tilling	210	690
Acres of pastures and rangeland with compost application	7,430	21,430
Acres of pastures and rangeland with prescribed grazing	22,300	57,140
Acres of pastures and rangeland practicing oak restoration	1,490	7,140
Acres of pastures and rangeland practicing riparian restoration	-	1,710
Acres of rangeland with range planting	2,870	13,780
Acres of grasslands with native grass restoration	2,610	13,150
Acres of forested areas undergoing annual fuel reduction	3,030	15,250

SOURCES

California Air Resources Board. 2010. "Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories." https://ww3.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

Appendix 5.13-1 Noise Appendix

Appendices

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LOCAL REGULATIONS AND STANDARDS

88-3.612 - Noise.

(a) Except as provided in subsection (b) of this section, a commercial WECS may not generate or emit any noise at any time that exceeds a maximum level of sixty-five decibels (dBA), as measured at each line of the exterior project boundary.

(b) A land use permit issued for a commercial WECS may authorize a maximum noise level that exceeds the level specified in subsection (a) if the commercial WECS is adjacent to an already-existing or approved commercial WECS and upon a finding that existing legal offsite residences and general plan-designated residential areas will not be adversely affected.

(c) A residential WECS may not generate or emit any noise at any time that exceeds a maximum level of sixty decibels (dBA), as measured at each line of the parcel upon which the residential WECS is installed.

(d) The measurement of commercial or residential WECS noise levels may not be adjusted for, or averaged with, periods of non-operation of the WECS. A site-specific noise study may be required to confirm compliance with the applicable noise standard. If noise generated or emitted by a commercial or residential WECS exceeds the applicable standard, the WECS operator must take measures necessary to comply with the standard, which may include discontinued operation of one or more WECS.

(Ord. No. 2011-04, § VI, 4-5-11; Ord. 85-39 § 4).

82-44.410 - Conditions.

(a) The zoning administrator may condition the issuance of a temporary events permit by imposing any of the following requirements concerning the time, place, and manner of the event. The zoning administrator may consult with public works, fire, and law enforcement officials and may impose time, place, and manner conditions that are requested by those officials, provided the requested conditions are among the conditions specified below. No conditions other than those specified below may be placed on a permit. Conditions may not restrict expressive activity or the content of speech.

(1) Alteration of the date, time, route or location of the event proposed on the application.

(2) Conditions concerning accommodation of pedestrian or vehicular traffic.

(3) Conditions concerning parking, including but not limited to requirements for the use of shuttles from parking areas to the venue.

(4) Conditions concerning traffic control, including but not limited to requirements for the use of traffic cones or barricades.

(5) Requirements for provision of on-site restrooms.

(6) Requirements for use of security responsible for crowed control, fire watch, general security, and evacuation of occupants.

(7) Conditions concerning maximum occupancy, based on the size of the venue and for purposes of minimizing impacts on traffic and parking. In imposing conditions concerning maximum occupancy, the zoning administrator may consider the lot size of the event venue, proximity of surrounding residences, density of the underlying zoning district, and the location and size of any buildings between the venue and surrounding properties.

(8) Restrictions on the number and type of structures at the event, and inspection and approval of structures.

(9) Compliance with animal protection ordinances and laws.

(10) Requirements for use of garbage containers and cleanup.

(11) Conditions limiting the duration of time and hours of the event (including the time to prepare and clean up the venue) in order to minimize impacts on traffic and parking.

(12) Time, place, and manner restrictions on the use of amplified sound. The use of amplified sound is prohibited in a residential district unless allowed as a condition of a temporary event permit.

(b) When a temporary event permit is granted for any event in a residential zoning district or at a residence in any other zoning district, it is granted subject to the following conditions:

(1) The event shall not generate or emit any noise or sound that exceeds any of the levels specified in the table below measured at the exterior of any dwelling unit located on another

residential property. The noise generated or emitted shall not exceed the levels specified in the table for the duration of time specified in the table. Exterior noise levels shall be measured with a sound level meter. The permit shall incorporate the applicable "allowable exterior noise levels" specified in the table into the permit conditions only for the duration of time allowed for the event by the permit. For example, if the permit provides that an event shall end by seven p.m., the "allowable exterior noise levels" allowed between nine a.m. and eight p.m. shall be incorporated into the conditions, but the event must end by seven p.m.

Allowable Exterior Noise Levels

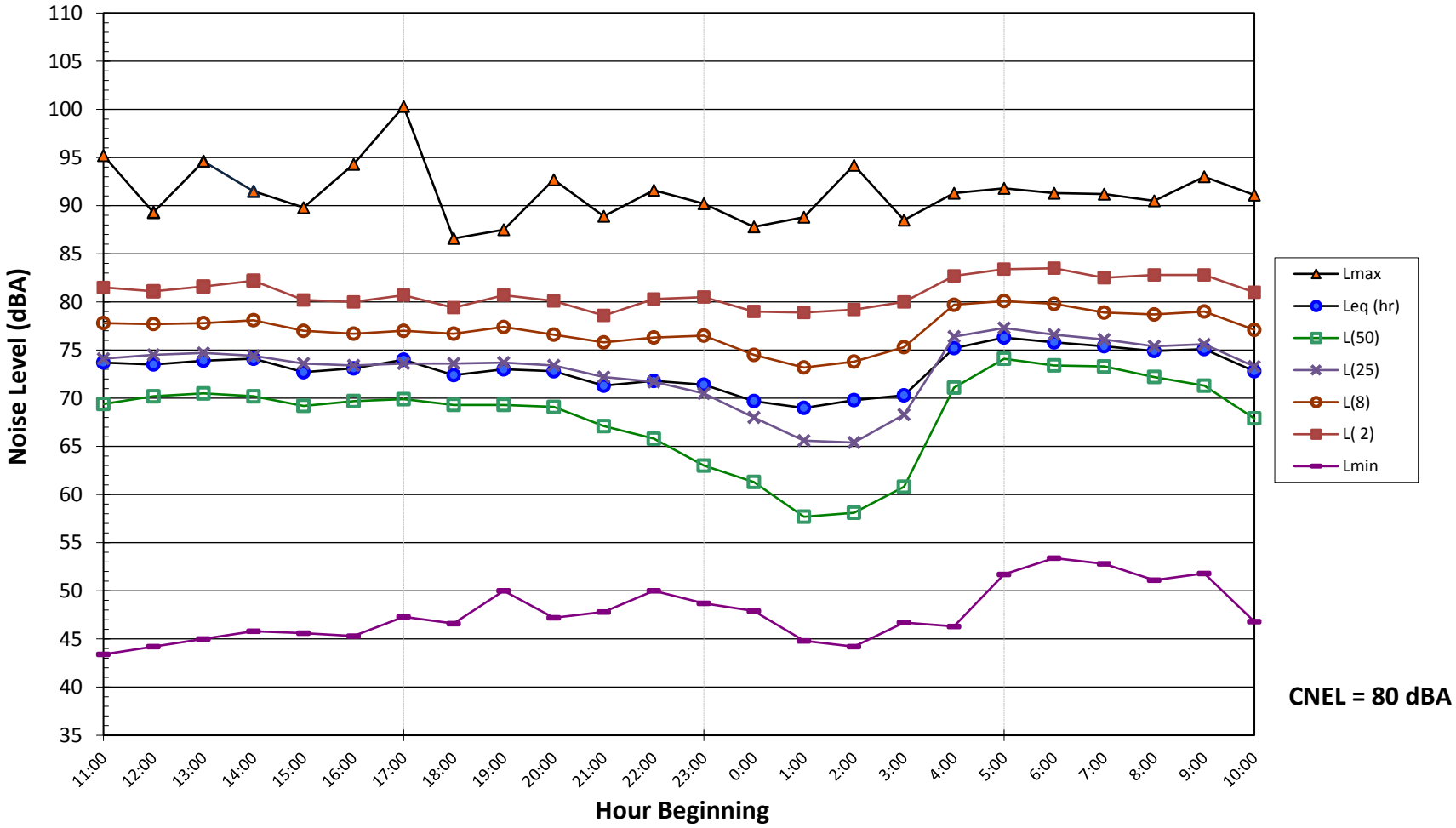
Cumulative Duration of Noise	9 a.m. - 8 p.m.	8 p.m. - 10 p.m.
30 minutes per hour	60 dBA	55 dBA
15 minutes per hour	65 dBA	60 dBA
5 minutes per hour	70 dBA	65 dBA
1 minute per hour	75 dBA	70 dBA
Level not to be exceeded at any time	80 dBA	75 dBA

(2) Amplified sound is prohibited after eight p.m. Sundays through Thursdays and after ten p.m. Fridays, Saturdays, and holidays. A temporary event permit shall not allow the use of amplified sound after these hours.

(Ord. No. 2010-11, § V, 7-13-10; Ord. 2005-25 § 2).

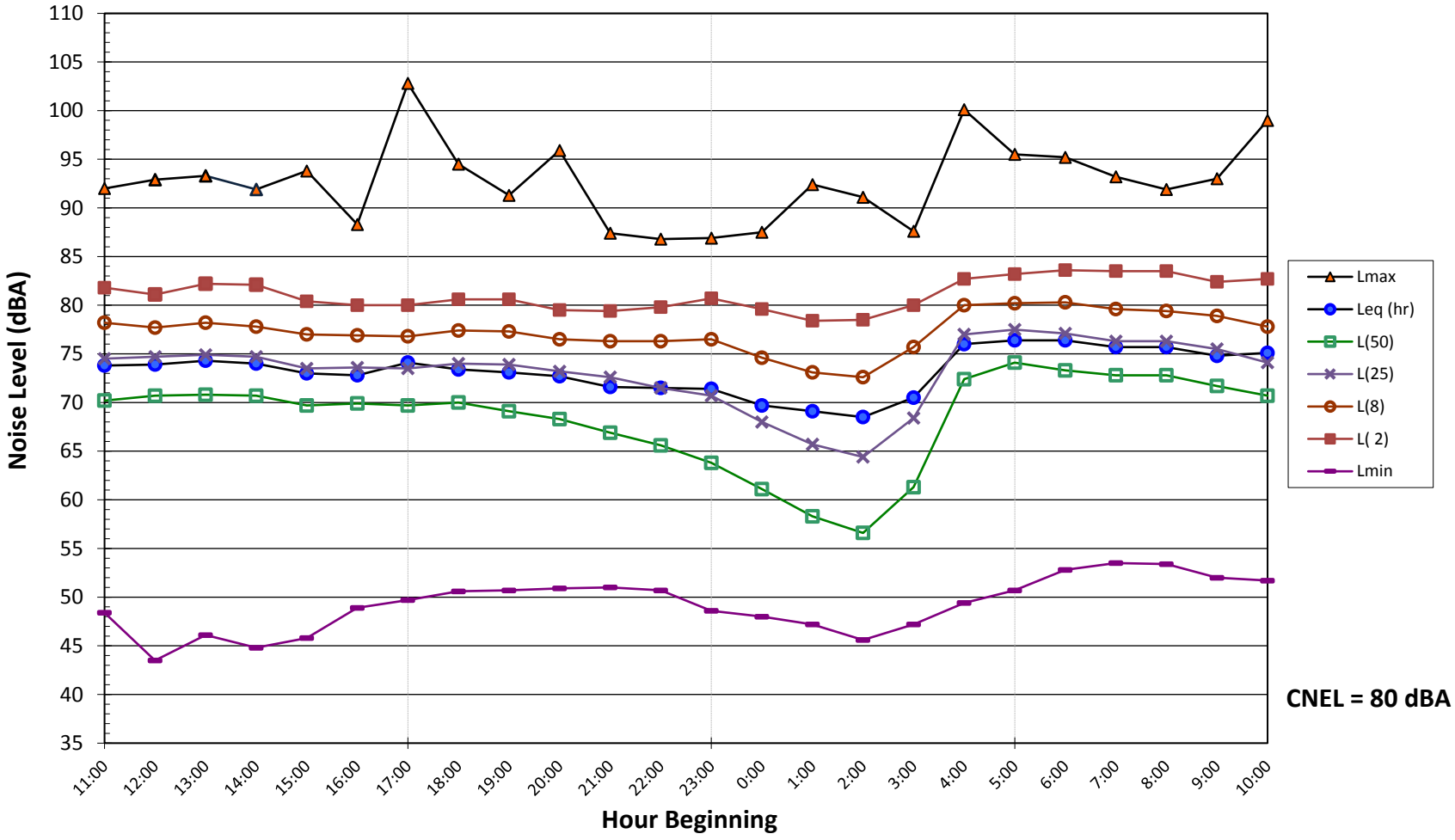
NOISE MONITORING LONG-TERM GRAPHS

Noise Levels at Noise Measurement Site LT-1
Contra Costa County, CA - General Plan Update
Tuesday, April 23, 2019

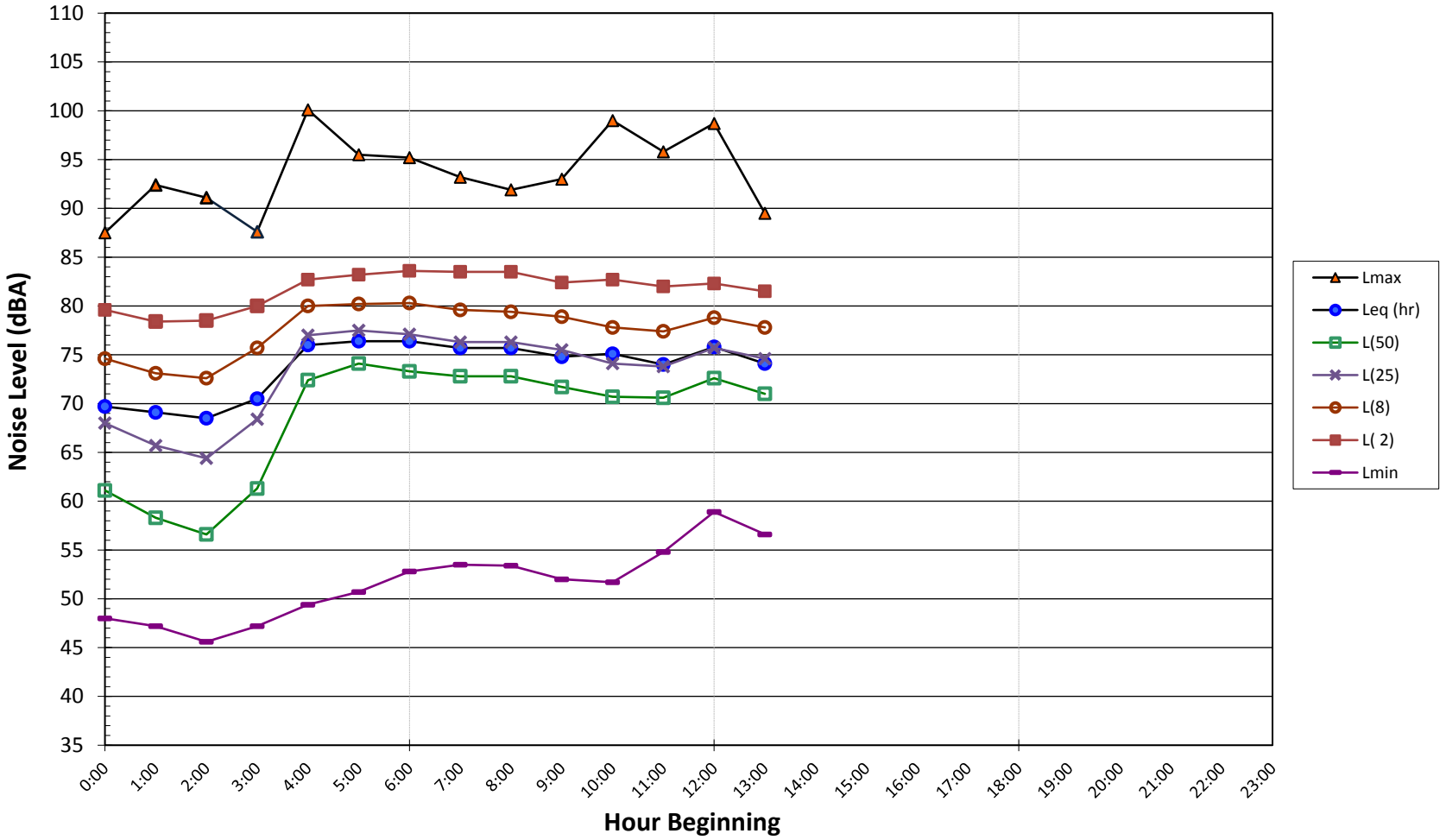


CNEL = 80 dBA

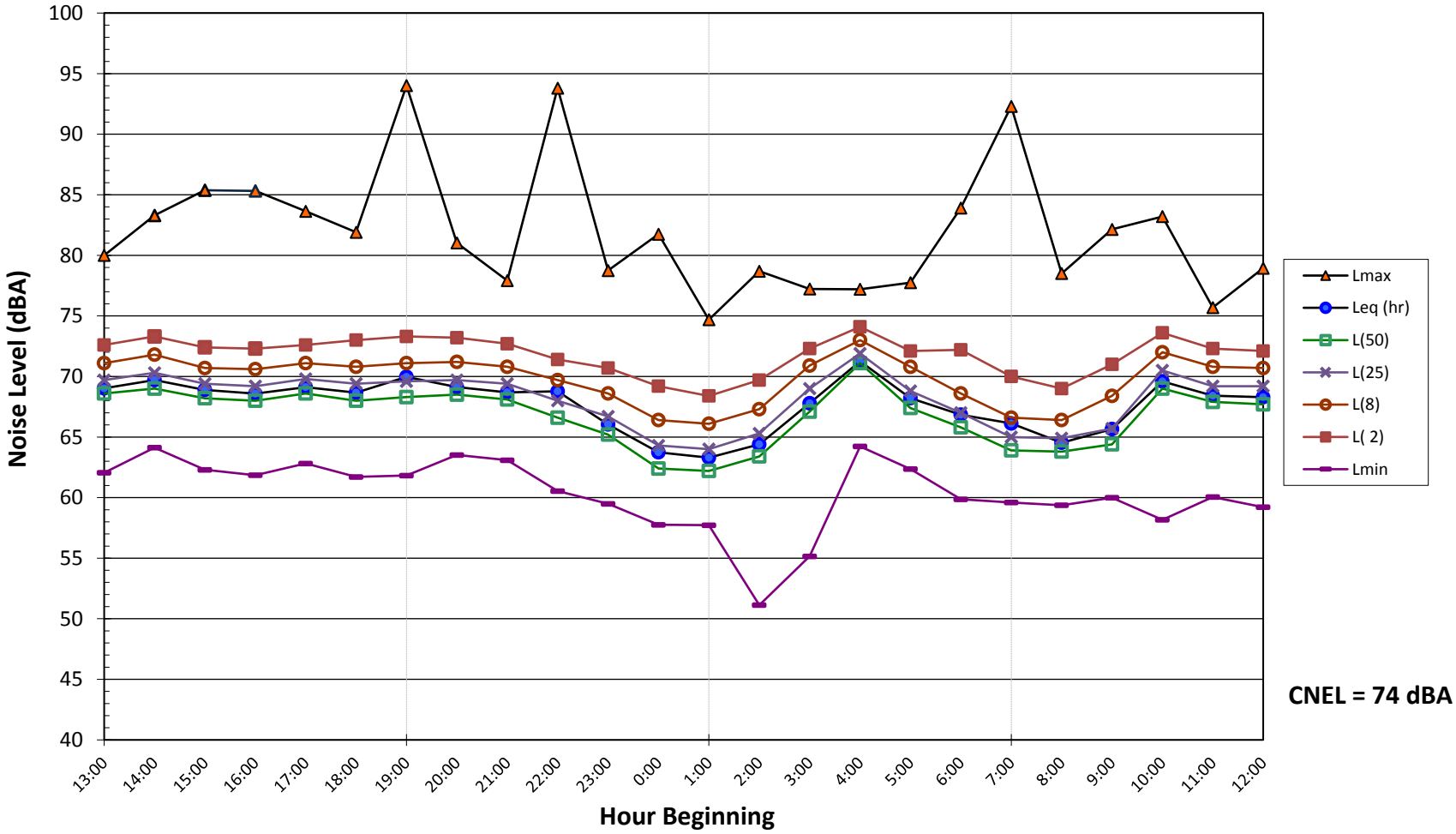
Noise Levels at Noise Measurement Site LT-1
Contra Costa County, CA - General Plan Update
Wednesday, April 24, 2019



Noise Levels at Noise Measurement Site LT-1
Contra Costa County, CA - General Plan Update
Thursday, April 25, 2019

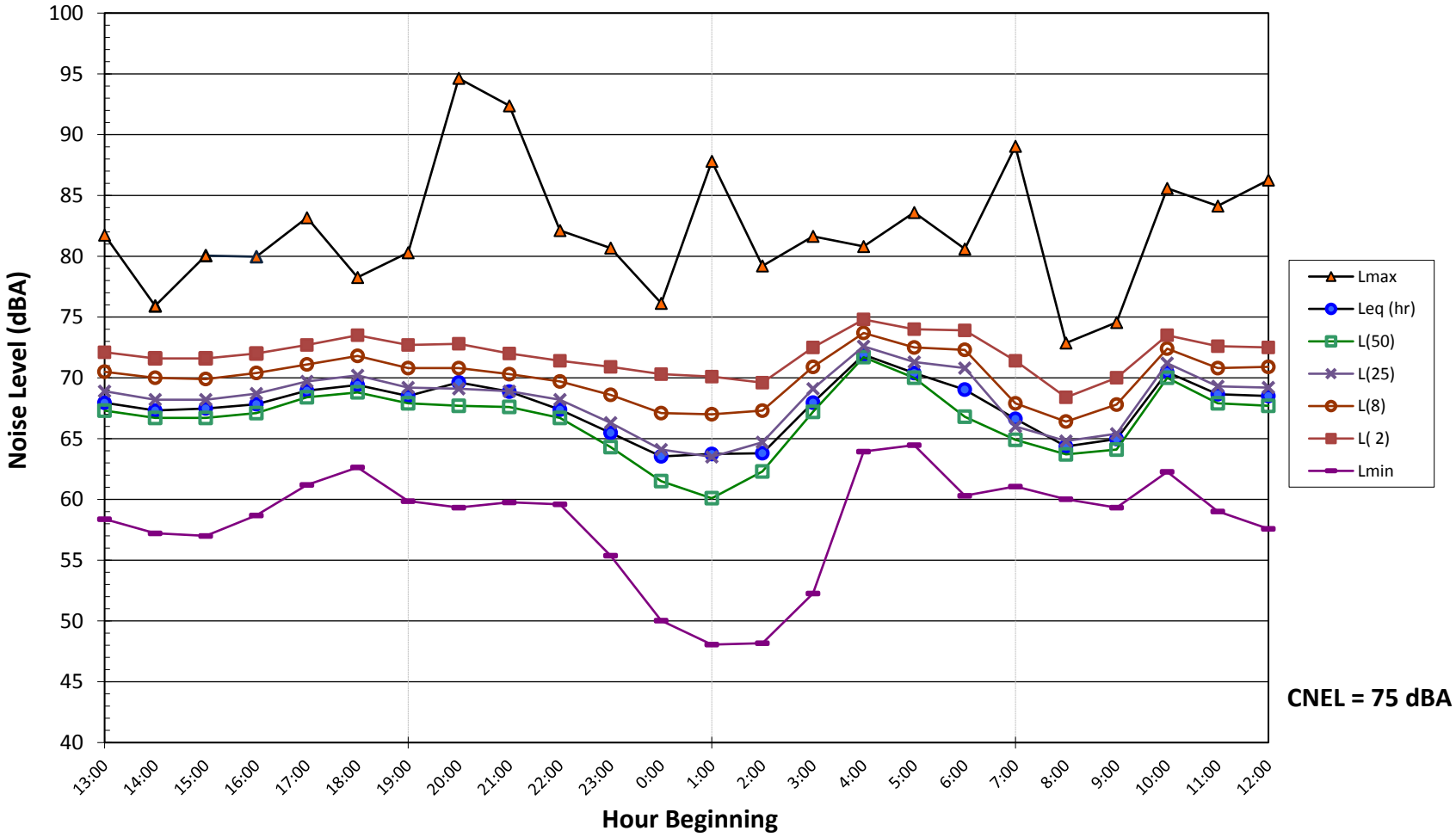


Noise Levels at Noise Measurement Site LT-2
Contra Costa County, CA - General Plan Update
Tuesday, April 23, 2019



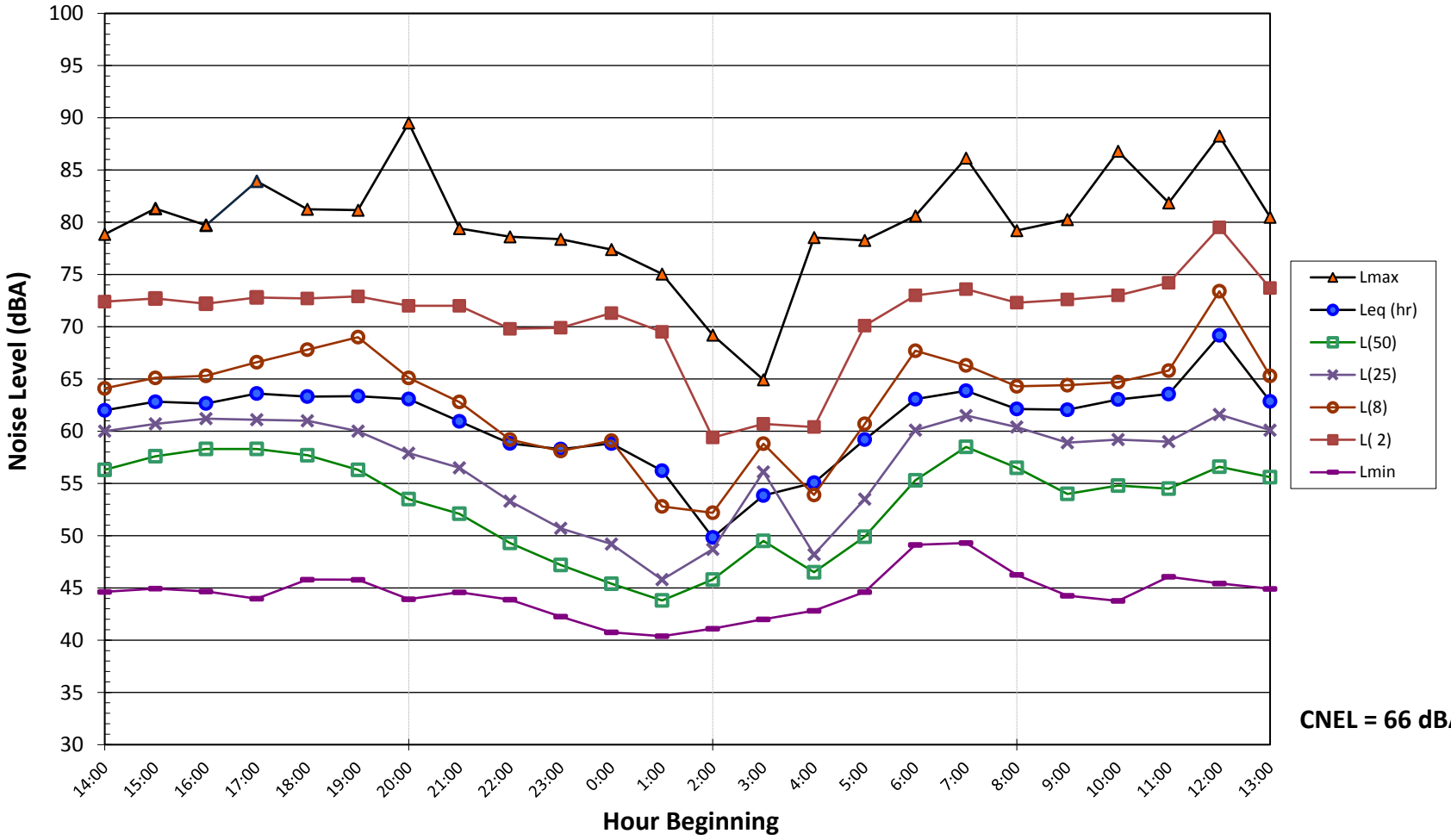
CNEL = 74 dBA

Noise Levels at Noise Measurement Site LT-2
Contra Costa County, CA - General Plan Update
Wednesday, April 24, 2019



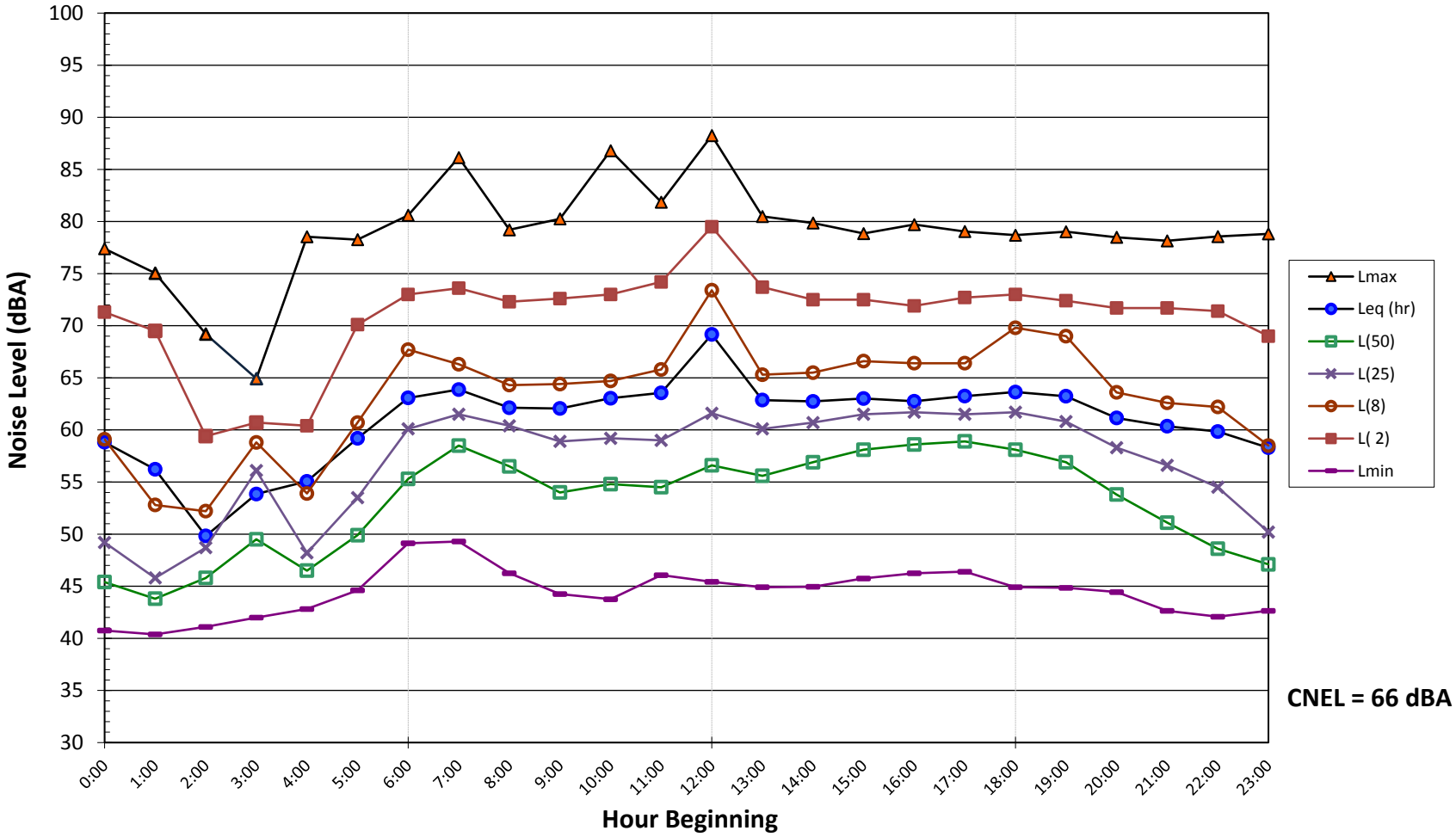
CNEL = 75 dBA

Noise Levels at Noise Measurement Site LT-3
Contra Costa County, CA - General Plan Update
Tuesday, April 23, 2019



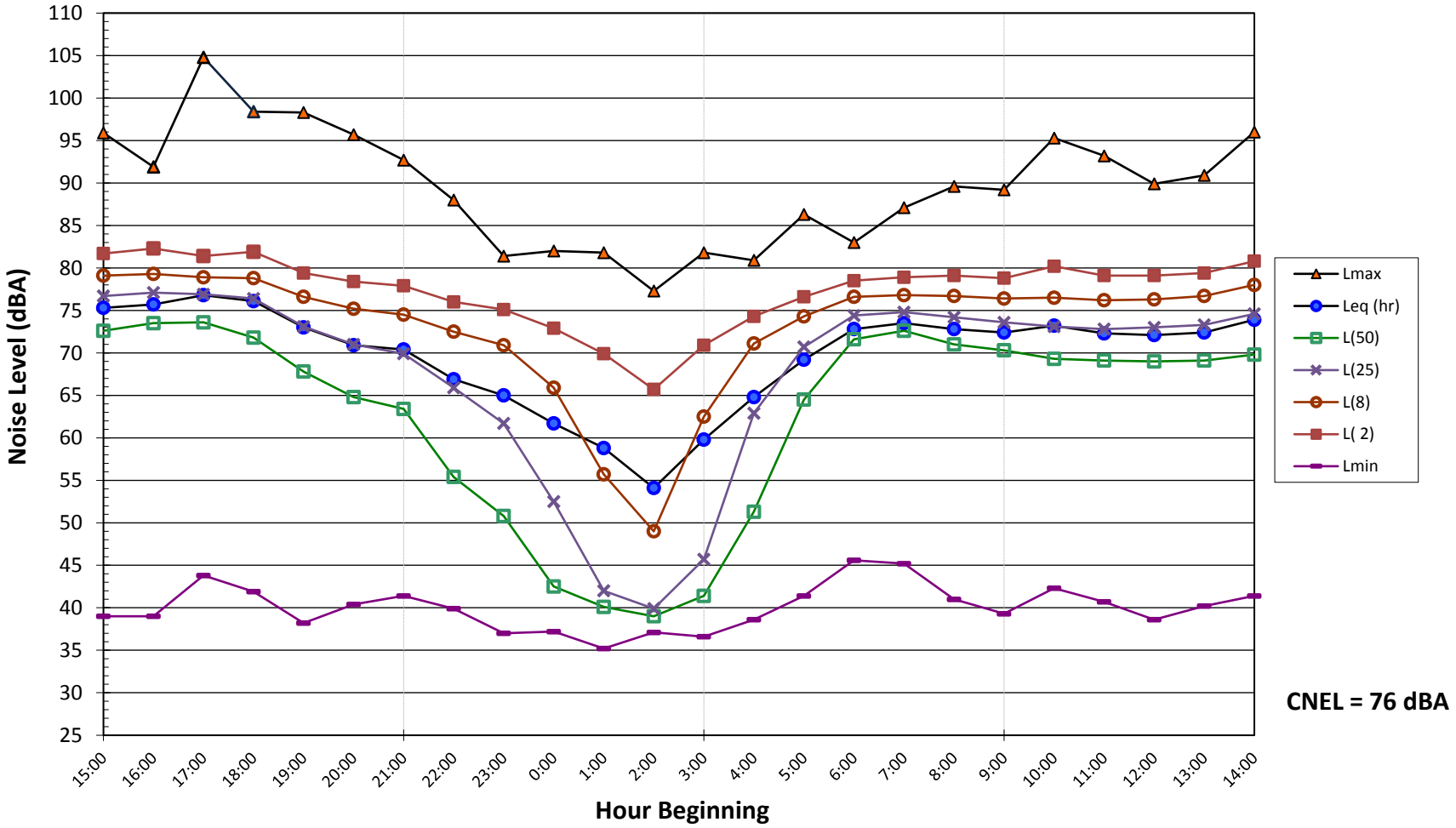
CNEL = 66 dBA

Noise Levels at Noise Measurement Site LT-3
Contra Costa County, CA - General Plan Update
Wednesday, April 24, 2019



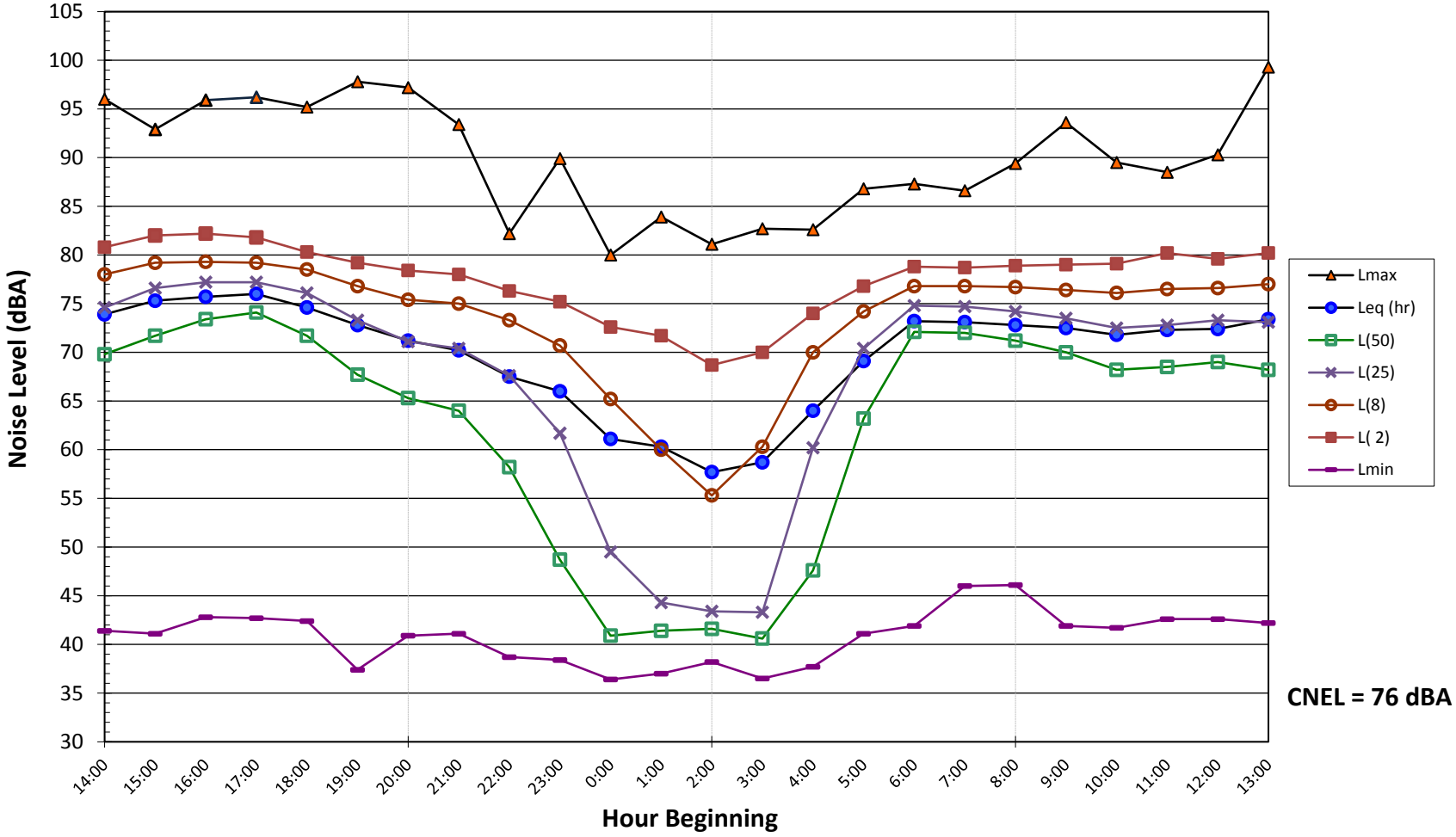
CNEL = 66 dBA

Noise Levels at Noise Measurement Site LT-4
Contra Costa County, CA - General Plan Update
Tuesday, April 23, 2019



CNEL = 76 dBA

Noise Levels at Noise Measurement Site LT-4
Contra Costa County, CA - General Plan Update
Wednesday, April 24, 2019



CNEL = 76 dBA

EXISTING CONDITIONS RAIL MODELING

FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	50
Future Train Speed (mph)	50
Number of Existing Trains in one Direction	9
Number of Future Trains in one Direction	9
Existing Number of Day Trains (7 am to 10 p.m.)	7
Future Number of Day Trains (7 am to 10 p.m.)	7
Existing Number of Night Trains (10 p.m. to 7 am)	2
Future Number of Night Trains (10 p.m. to 7 am)	2
Existing Average Number of Cars	44
Future Average Number of Cars	44
Existing Average Number of Locomotives	2.3
Future Average Number of Locomotives	2.3

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

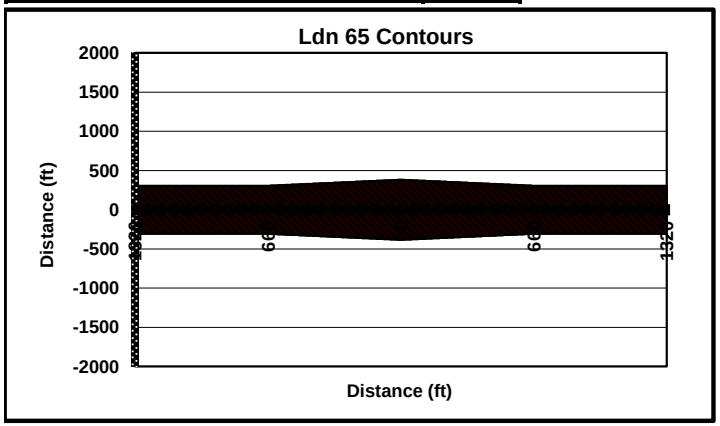
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

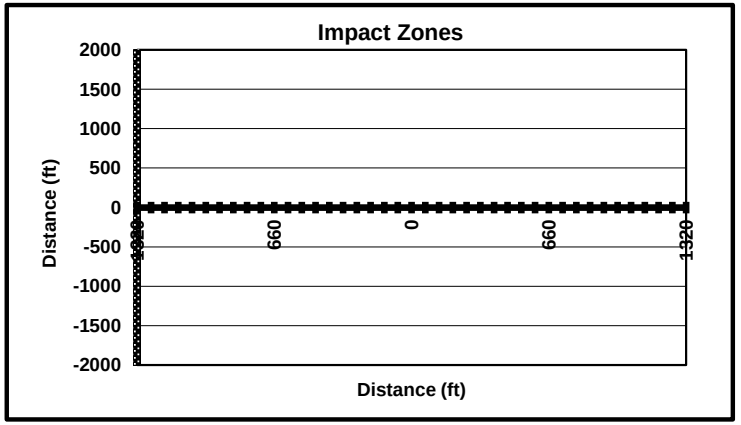
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	382
Future 65 Ldn Contour at X-ing	382
Existing 65 Ldn Contour at 1/2 zone length	305
Future 65 Ldn Contour at 1/2 zone length	305
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	50
Future Train Speed (mph)	50
Number of Existing Trains in one Direction	4
Number of Future Trains in one Direction	4
Existing Number of Day Trains (7 am to 10 p.m.)	2
Future Number of Day Trains (7 am to 10 p.m.)	2
Existing Number of Night Trains (10 p.m. to 7 am)	2
Future Number of Night Trains (10 p.m. to 7 am)	2
Existing Average Number of Cars	50
Future Average Number of Cars	50
Existing Average Number of Locomotives	4
Future Average Number of Locomotives	4

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

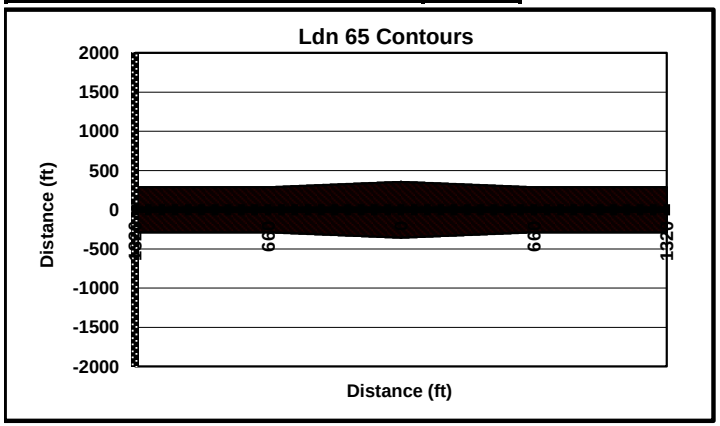
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

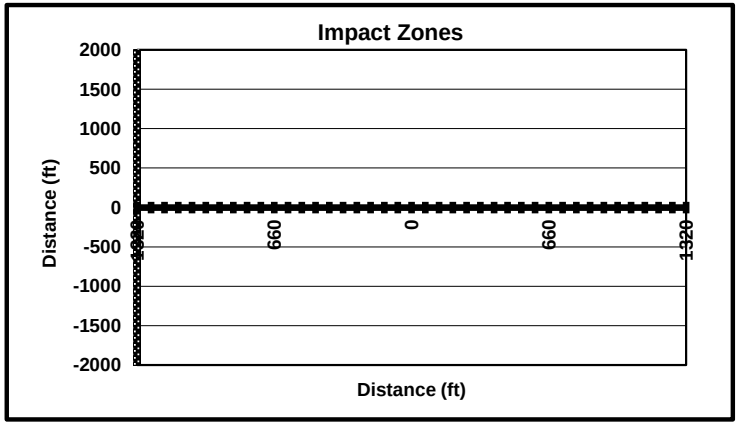
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	355
Future 65 Ldn Contour at X-ing	355
Existing 65 Ldn Contour at 1/2 zone length	286
Future 65 Ldn Contour at 1/2 zone length	286
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	1
Number of Future Trains in one Direction	1
Existing Number of Day Trains (7 am to 10 p.m.)	1
Future Number of Day Trains (7 am to 10 p.m.)	1
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

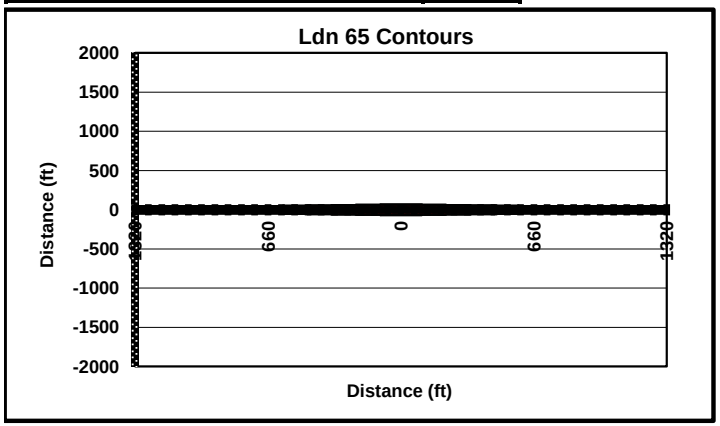
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

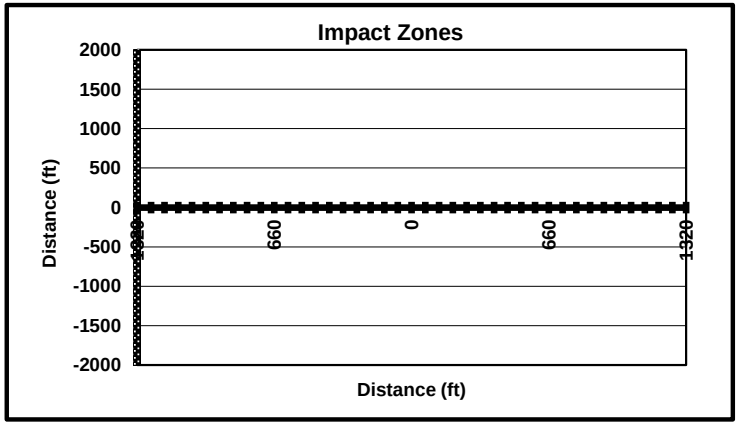
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	69
Future 65 Ldn Contour at X-ing	69
Existing 65 Ldn Contour at 1/2 zone length	47
Future 65 Ldn Contour at 1/2 zone length	47
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	1
Number of Future Trains in one Direction	1
Existing Number of Day Trains (7 am to 10 p.m.)	1
Future Number of Day Trains (7 am to 10 p.m.)	1
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

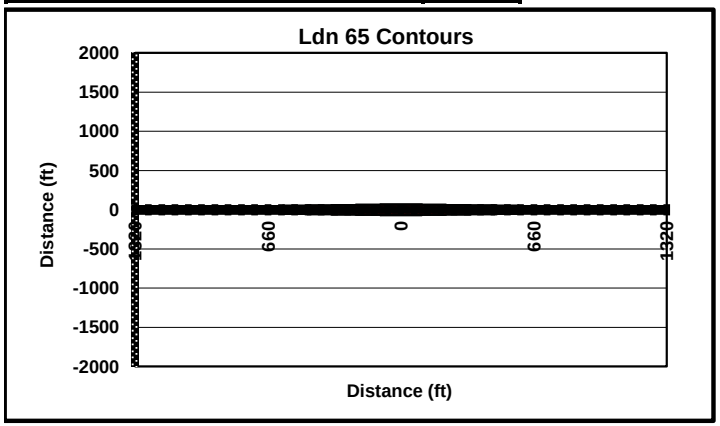
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

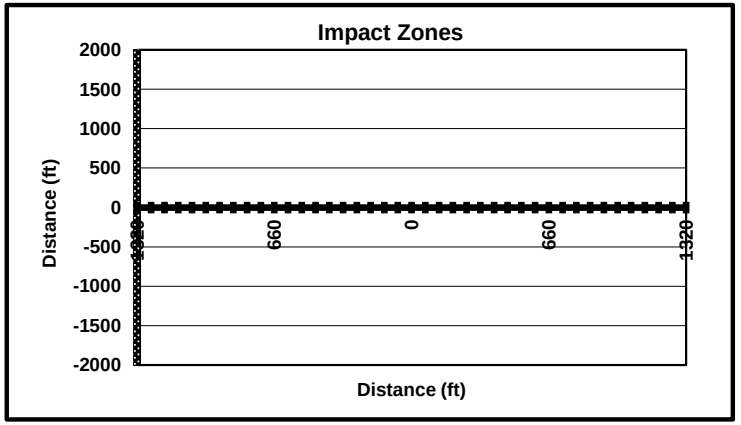
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	69
Future 65 Ldn Contour at X-ing	69
Existing 65 Ldn Contour at 1/2 zone length	47
Future 65 Ldn Contour at 1/2 zone length	47
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	7
Number of Future Trains in one Direction	7
Existing Number of Day Trains (7 am to 10 p.m.)	7
Future Number of Day Trains (7 am to 10 p.m.)	7
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

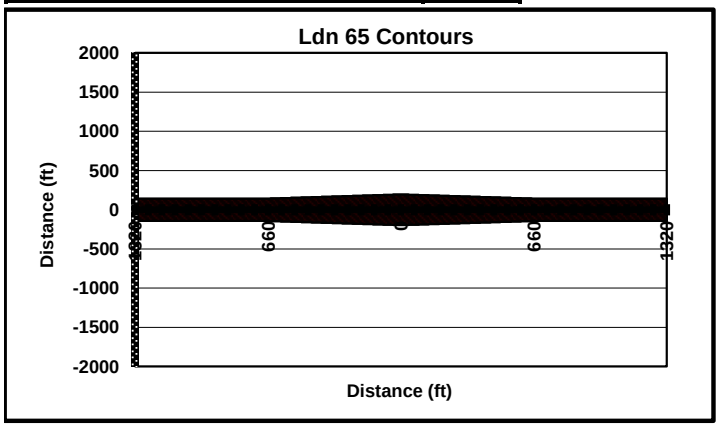
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

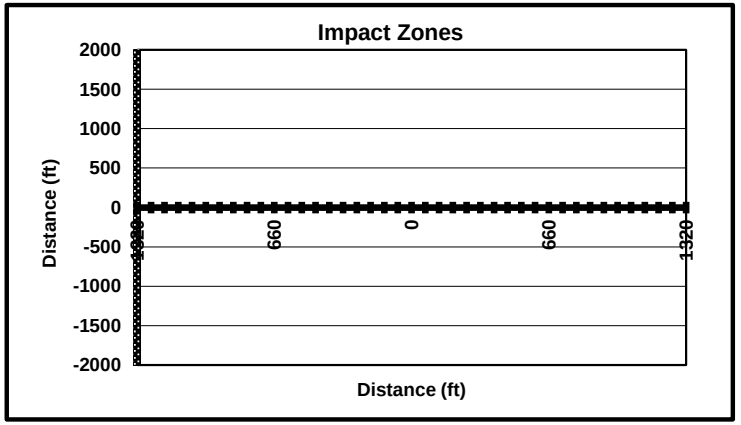
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	195
Future 65 Ldn Contour at X-ing	195
Existing 65 Ldn Contour at 1/2 zone length	142
Future 65 Ldn Contour at 1/2 zone length	142
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	11
Number of Future Trains in one Direction	11
Existing Number of Day Trains (7 am to 10 p.m.)	11
Future Number of Day Trains (7 am to 10 p.m.)	11
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

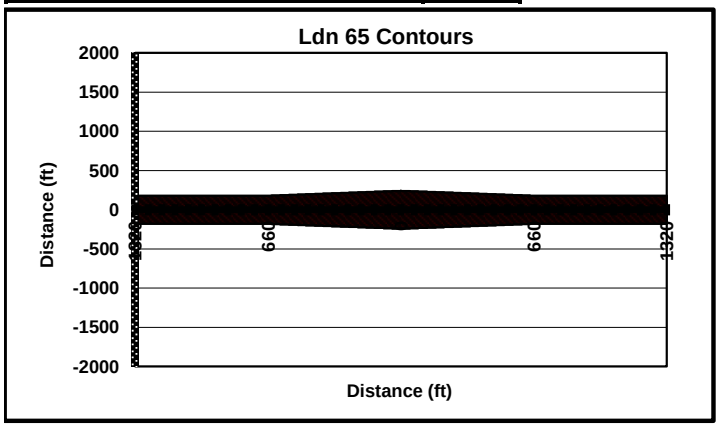
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

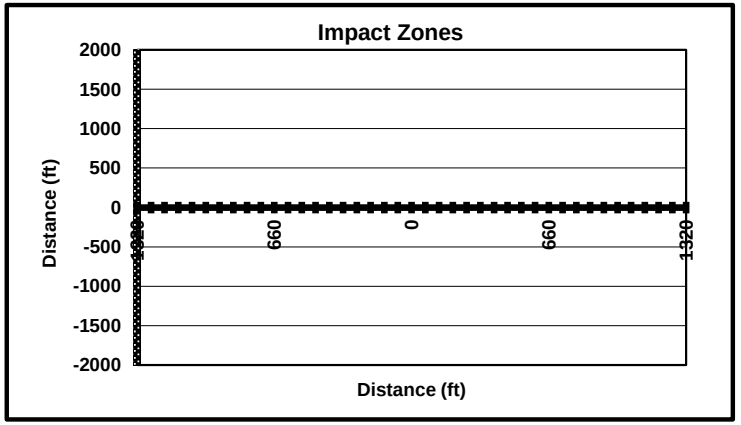
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	241
Future 65 Ldn Contour at X-ing	241
Existing 65 Ldn Contour at 1/2 zone length	178
Future 65 Ldn Contour at 1/2 zone length	178
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	97
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	50
Future Train Speed (mph)	50
Number of Existing Trains in one Direction	5
Number of Future Trains in one Direction	5
Existing Number of Day Trains (7 am to 10 p.m.)	5
Future Number of Day Trains (7 am to 10 p.m.)	5
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	5
Future Average Number of Cars	5
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

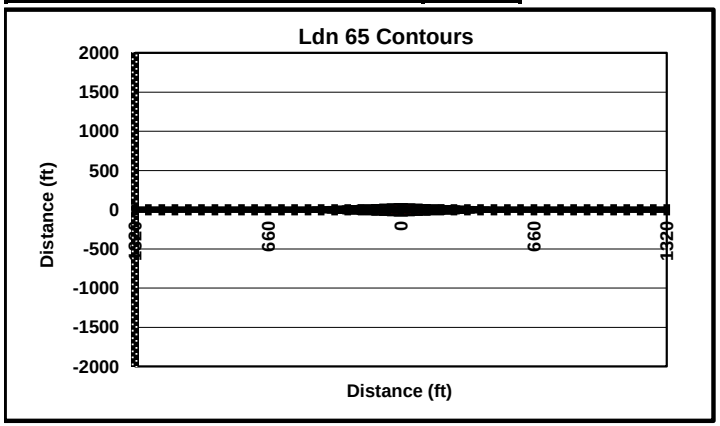
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

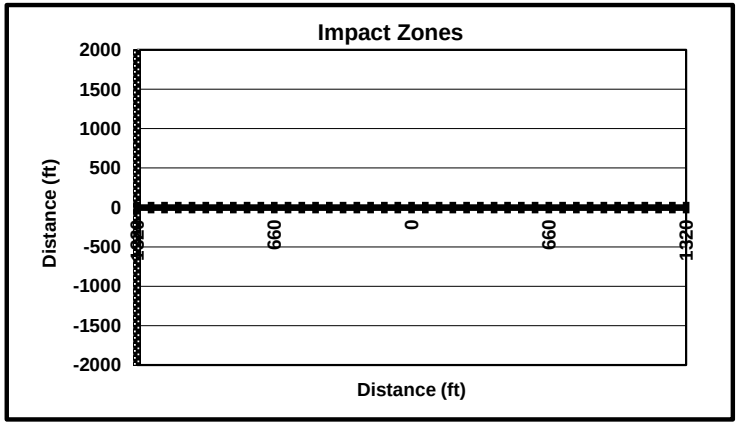
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	73
Future 65 Ldn Contour at X-ing	73
Existing 65 Ldn Contour at 1/2 zone length	0
Future 65 Ldn Contour at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: BNSF Richmond Yard Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	61	58
Source 1	64	60	57
Source 2	59	55	52
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	35	distance (ft)	35		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.8	trains/hour	0.8		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)	10	speed (mph)	10		
(10 PM - 7 AM)	trains/hour	0.444	trains/hour	0.444		
	locos/train	1	length of cars (ft) / train	600		
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: BNSF Siberia Lead Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	61	58
Source 1	64	60	57
Source 2	59	55	52
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	35	distance (ft)	35		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.8	trains/hour	0.8		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)	10	speed (mph)	10		
(10 PM - 7 AM)	trains/hour	0.444	trains/hour	0.444		
	locos/train	1	length of cars (ft) / train	600		
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: BNSF Stockton Sub Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	57	59
Source 1	44	45	31
Source 2	40	42	9
Source 3	62	53	56
Source 4	63	54	56
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	210	distance (ft)	210	distance (ft)	210	distance (ft)	210
Daytime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	50	speed (mph)	50
(7 AM - 10 PM)	trains/hour	0.667	trains/hour	0.667	trains/hour	0.267	trains/hour	0.267
	locos/train	1	cars/train	5	locos/train	4	length of cars (ft) / train	4000
Nighttime Hours	speed (mph)		speed (mph)		speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour		trains/hour		trains/hour	0.444	trains/hour	0.444
	locos/train		cars/train		locos/train	4	length of cars (ft) / train	4000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: BNSF Stockton Past Port Chicago Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	58	59
Source 1	62	53	56
Source 2	63	56	56
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	210	distance (ft)	210		
Daytime Hours	speed (mph)	50	speed (mph)	50		
(7 AM - 10 PM)	trains/hour	0.267	trains/hour	0.444		
	locos/train	4	length of cars (ft) / train	4000		
Nighttime Hours	speed (mph)	50	speed (mph)	50		
(10 PM - 7 AM)	trains/hour	0.444	trains/hour	0.444		
	locos/train	4	length of cars (ft) / train	4000		
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: RPRC Chevron Lead Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	66	53
Source 1	64	65	53
Source 2	57	59	36
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	5	distance (ft)	5		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.133	trains/hour	0.133		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: RPRC Cutting Lead Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	66	53
Source 1	64	65	53
Source 2	57	59	36
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	5	distance (ft)	5		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.133	trains/hour	0.133		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: RPRC Harbor Lead Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	67	46
Source 1	64	66	46
Source 2	59	61	29
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	15	distance (ft)	15		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.933	trains/hour	0.933		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: RPRC LRT Lead Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	67	44
Source 1	64	66	44
Source 2	59	61	27
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	20	distance (ft)	20		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	1.467	trains/hour	1.467		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: UP Martinez Sub Existing East of Pinole

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	58	59
Source 1	52	51	43
Source 2	49	48	40
Source 3	61	52	54
Source 4	63	54	57
Source 5	48	40	42
Source 6	46	38	40
Source 7	42	42	32
Source 8	37	39	10

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	175	distance (ft)	175	distance (ft)	175	distance (ft)	175
Daytime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	40	speed (mph)	40
(7 AM - 10 PM)	trains/hour	1.934	trains/hour	1.934	trains/hour	0.267	trains/hour	0.267
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Nighttime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	40	speed (mph)	40
(10 PM - 7 AM)	trains/hour	0.333	trains/hour	0.333	trains/hour	0.444	trains/hour	0.444
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Source 1 and 2 = Amtrak San Joaquin and Capitol Corridor
Source 3 and 4 = Freight trains
Source 5 and 6 - Amtrak Coast Starlight
Sources 7 and 8 - Amtrak California Zephyr

Source 5		**Source 6**		**Source 7**		**Source 8**	
Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Commuter Diesel Locomotive	2	Commuter Rail Cars	3
distance (ft)	175	distance (ft)	175	distance (ft)	175	distance (ft)	175
speed (mph)	50	speed (mph)	50	speed (mph)	50	speed (mph)	50
trains/hour	0.067	trains/hour	0.067	trains/hour	0.133	trains/hour	0.133
locos/train	2	cars/train	13	locos/train	2	cars/train	8
speed (mph)	50	speed (mph)	50	speed (mph)	0	speed (mph)	0
trains/hour	0.111	trains/hour	0.111	trains/hour	0	trains/hour	0
locos/train	2	cars/train	13	locos/train	0	cars/train	0
	0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: UP Martinez Sub Existing South of Pinole

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	58	59
Source 1	50	49	41
Source 2	49	48	41
Source 3	60	52	54
Source 4	63	55	57
Source 5	46	37	39
Source 6	46	38	40
Source 7	40	40	31
Source 8	37	39	9

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	220	distance (ft)	220	distance (ft)	220	distance (ft)	220
Daytime Hours	speed (mph)	60	speed (mph)	60	speed (mph)	50	speed (mph)	50
(7 AM - 10 PM)	trains/hour	1.934	trains/hour	1.934	trains/hour	0.267	trains/hour	0.267
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Nighttime Hours	speed (mph)	60	speed (mph)	60	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	0.333	trains/hour	0.333	trains/hour	0.444	trains/hour	0.444
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Source 1 and 2 = Amtrak San Joaquin and Capitol Corridor
Source 3 and 4 = Freight trains
Source 5 and 6 - Amtrak Coast Starlight
Sources 7 and 8 - Amtrak California Zephyr

Source 5		Source 6		Source 7		Source 8	
Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Commuter Diesel Locomotive	2	Commuter Rail Cars	3
distance (ft)	220	distance (ft)	220	distance (ft)	220	distance (ft)	220
speed (mph)	60	speed (mph)	60	speed (mph)	60	speed (mph)	60
trains/hour	0.067	trains/hour	0.067	trains/hour	0.133	trains/hour	0.133
locos/train	2	cars/train	13	locos/train	2	cars/train	8
speed (mph)	60	speed (mph)	60	speed (mph)	0	speed (mph)	0
trains/hour	0.111	trains/hour	0.111	trains/hour	0	trains/hour	0
locos/train	2	cars/train	13	locos/train	0	cars/train	0
	0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
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Case: UP Tracy Sub Existing

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	67	51
Source 1	64	65	51
Source 2	60	62	29
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3		
Distance (source to receiver)	distance (ft)	10	distance (ft)	10		
Daytime Hours	speed (mph)	50	speed (mph)	50		
(7 AM - 10 PM)	trains/hour	0.667	trains/hour	0.667		
	locos/train	1	cars/train	5		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		cars/train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

FUTURE RAIL CONDITIONS MODELING

FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	50
Future Train Speed (mph)	50
Number of Existing Trains in one Direction	6
Number of Future Trains in one Direction	6
Existing Number of Day Trains (7 am to 10 p.m.)	3
Future Number of Day Trains (7 am to 10 p.m.)	3
Existing Number of Night Trains (10 p.m. to 7 am)	3
Future Number of Night Trains (10 p.m. to 7 am)	3
Existing Average Number of Cars	50
Future Average Number of Cars	50
Existing Average Number of Locomotives	4
Future Average Number of Locomotives	4

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

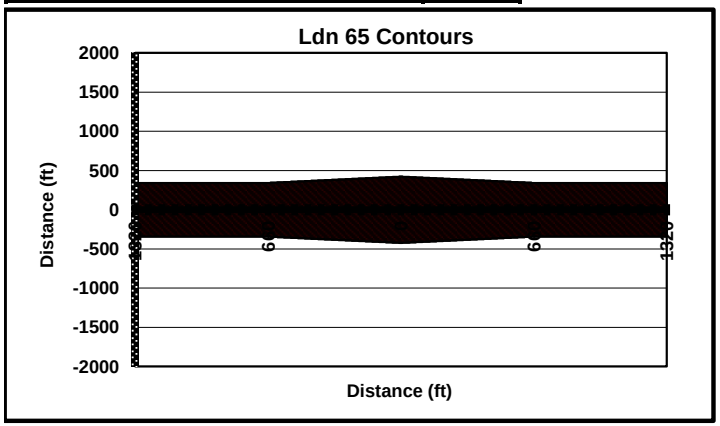
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

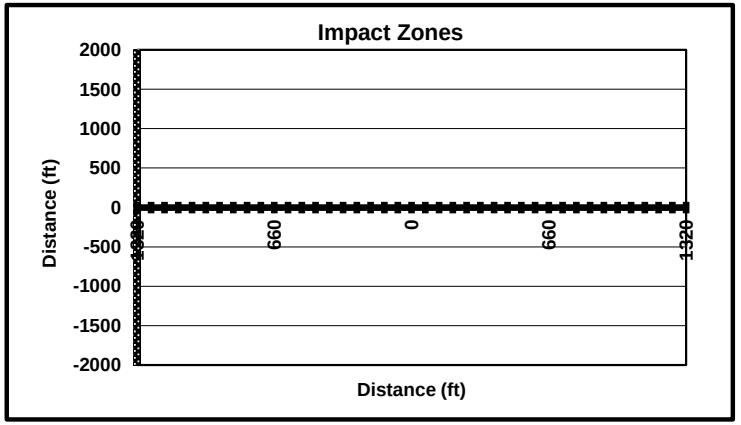
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	421
Future 65 Ldn Contour at X-ing	421
Existing 65 Ldn Contour at 1/2 zone length	341
Future 65 Ldn Contour at 1/2 zone length	341
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	50
Future Train Speed (mph)	50
Number of Existing Trains in one Direction	13
Number of Future Trains in one Direction	13
Existing Number of Day Trains (7 am to 10 p.m.)	10
Future Number of Day Trains (7 am to 10 p.m.)	10
Existing Number of Night Trains (10 p.m. to 7 am)	3
Future Number of Night Trains (10 p.m. to 7 am)	3
Existing Average Number of Cars	44
Future Average Number of Cars	44
Existing Average Number of Locomotives	2.38
Future Average Number of Locomotives	2.38

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

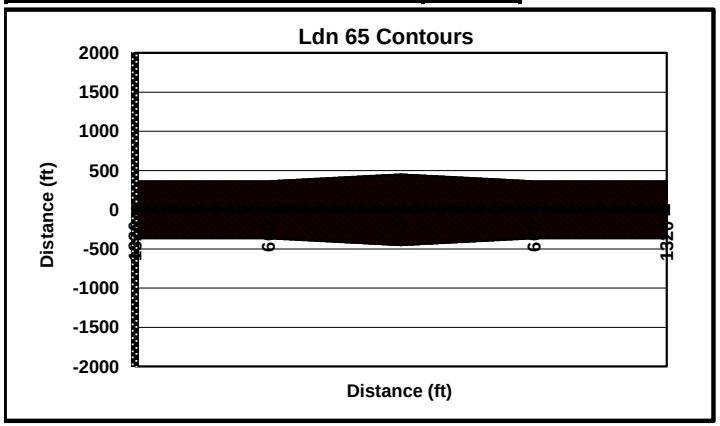
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

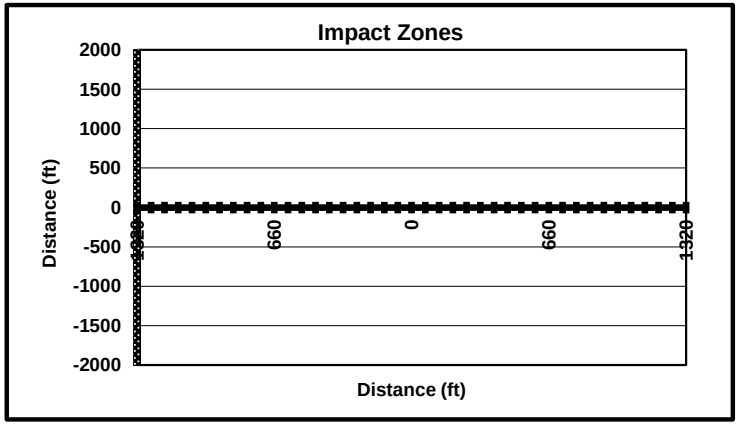
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	449
Future 65 Ldn Contour at X-ing	449
Existing 65 Ldn Contour at 1/2 zone length	361
Future 65 Ldn Contour at 1/2 zone length	361
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	1.5
Number of Future Trains in one Direction	1.5
Existing Number of Day Trains (7 am to 10 p.m.)	1.5
Future Number of Day Trains (7 am to 10 p.m.)	1.5
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

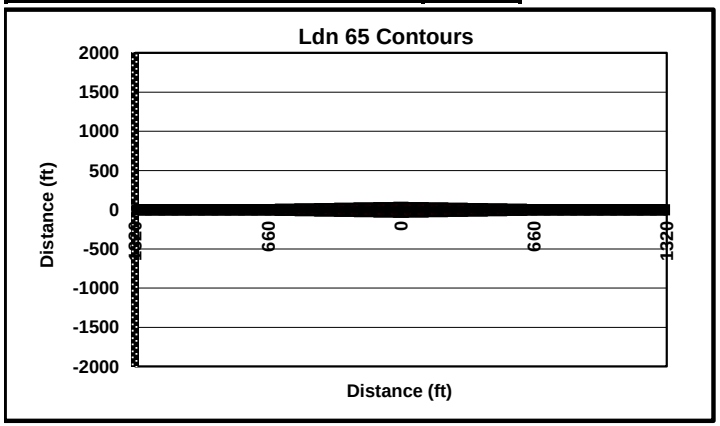
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

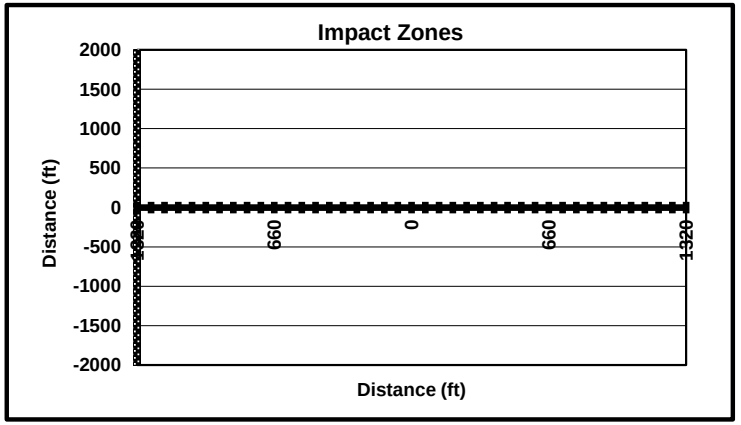
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	87
Future 65 Ldn Contour at X-ing	87
Existing 65 Ldn Contour at 1/2 zone length	60
Future 65 Ldn Contour at 1/2 zone length	60
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	1.5
Number of Future Trains in one Direction	1.5
Existing Number of Day Trains (7 am to 10 p.m.)	1.5
Future Number of Day Trains (7 am to 10 p.m.)	1.5
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

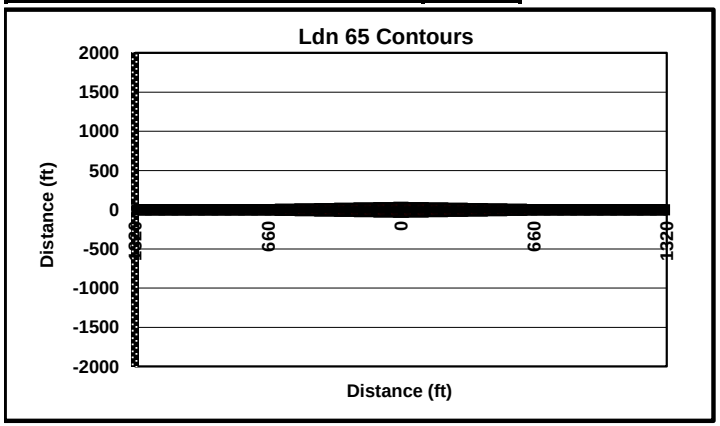
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

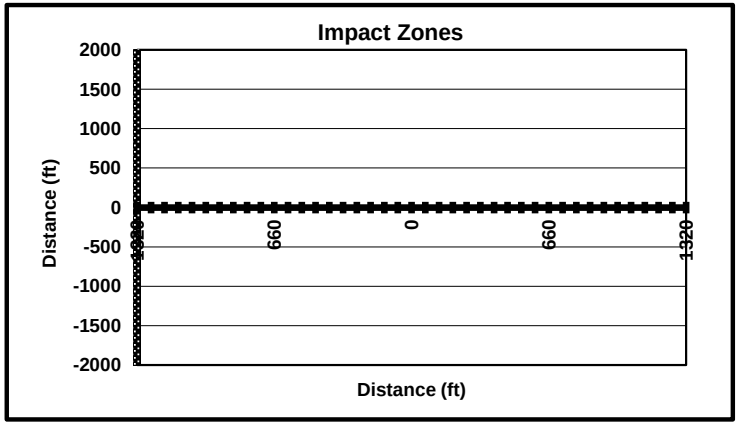
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	87
Future 65 Ldn Contour at X-ing	87
Existing 65 Ldn Contour at 1/2 zone length	60
Future 65 Ldn Contour at 1/2 zone length	60
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	10.5
Number of Future Trains in one Direction	10.5
Existing Number of Day Trains (7 am to 10 p.m.)	10.5
Future Number of Day Trains (7 am to 10 p.m.)	10.5
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

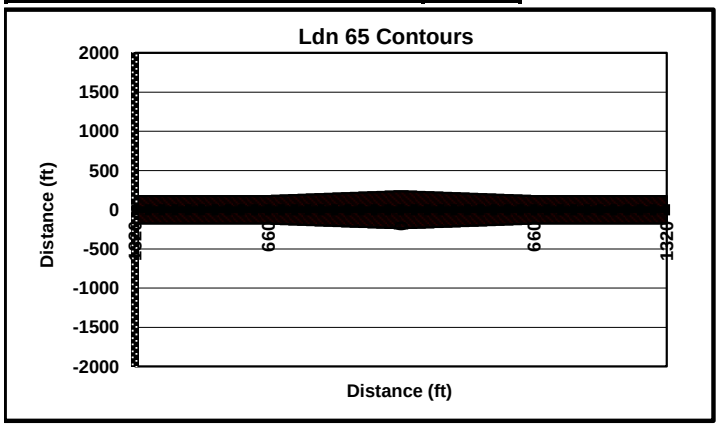
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

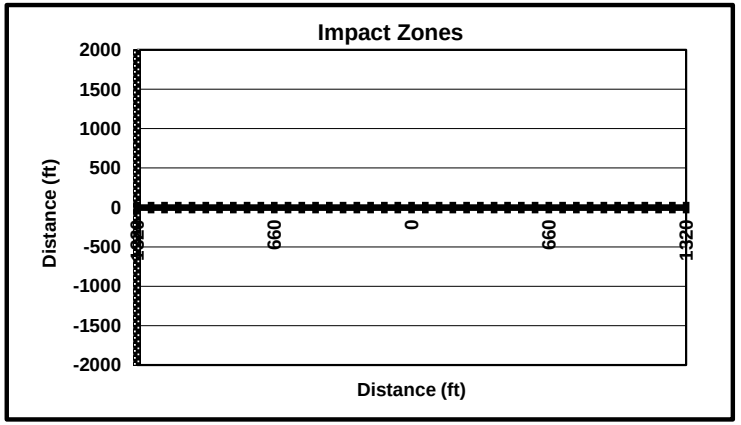
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	236
Future 65 Ldn Contour at X-ing	236
Existing 65 Ldn Contour at 1/2 zone length	174
Future 65 Ldn Contour at 1/2 zone length	174
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	10
Future Train Speed (mph)	10
Number of Existing Trains in one Direction	16.5
Number of Future Trains in one Direction	16.5
Existing Number of Day Trains (7 am to 10 p.m.)	16.5
Future Number of Day Trains (7 am to 10 p.m.)	16.5
Existing Number of Night Trains (10 p.m. to 7 am)	0
Future Number of Night Trains (10 p.m. to 7 am)	0
Existing Average Number of Cars	10
Future Average Number of Cars	10
Existing Average Number of Locomotives	1
Future Average Number of Locomotives	1

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

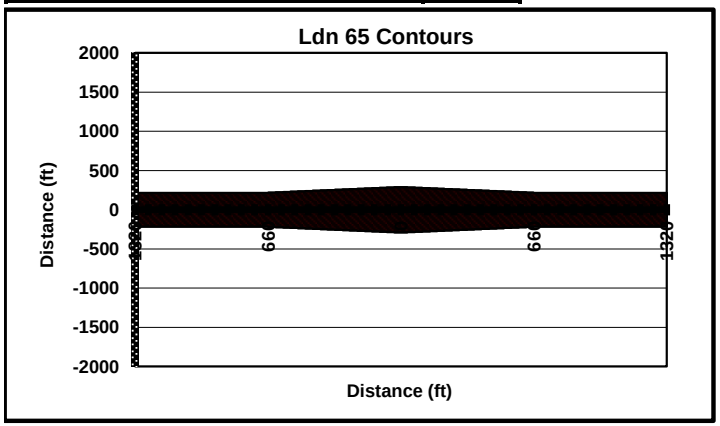
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

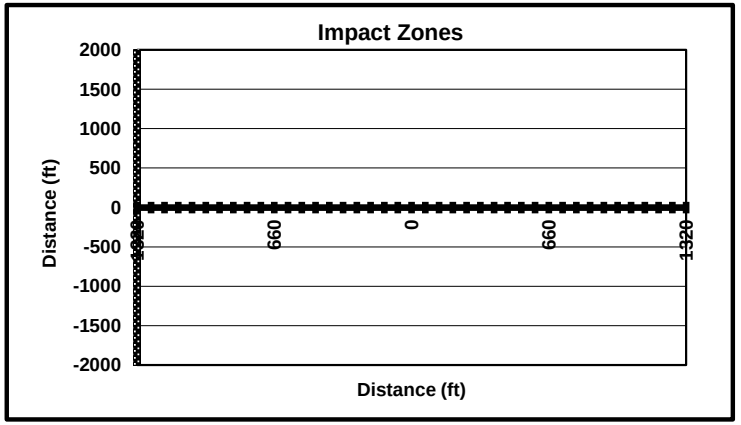
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	289
Future 65 Ldn Contour at X-ing	289
Existing 65 Ldn Contour at 1/2 zone length	216
Future 65 Ldn Contour at 1/2 zone length	216
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





FRA Grade Crossing Noise Model

User Input	
Noise Situation (Pick from List)	1
Horn Lmax (dBA) @ 100 feet	104
Horn Location on Locomotive(Pick from List)	1
Non Train Noise Environment (pick from list)	2
Shielding (Pick from List)	4
Length of Impact Area (pick from list)	1
Existing Train Speed (mph)	50
Future Train Speed (mph)	50
Number of Existing Trains in one Direction	12
Number of Future Trains in one Direction	12
Existing Number of Day Trains (7 am to 10 p.m.)	10.5
Future Number of Day Trains (7 am to 10 p.m.)	10.5
Existing Number of Night Trains (10 p.m. to 7 am)	1.5
Future Number of Night Trains (10 p.m. to 7 am)	1.5
Existing Average Number of Cars	119
Future Average Number of Cars	119
Existing Average Number of Locomotives	2.25
Future Average Number of Locomotives	2.25

Noise Situation	
Horns Existing and Future	1
Horns in Future Only	2
No Horns Existing and Future	3

Horn Location on Locomotive			
National Average (50% front, 50% middle)			1
All Front Mounted			2
All Middle Mounted			3
User Defined	80	% front mounted horns	4

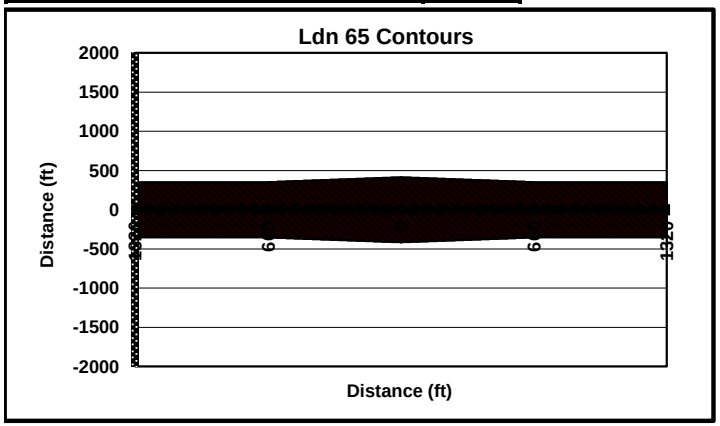
Non Train Noise Environment			
Urban			1
Suburban			2
Rural			3
User Defined Ldn =	50	dBA	4

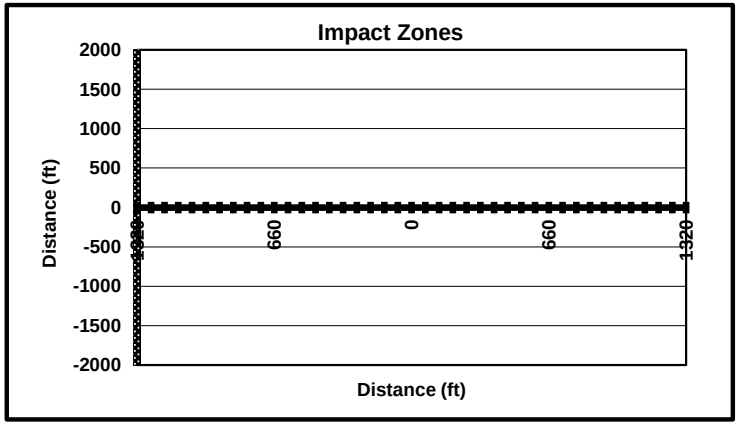
Shielding	
Dense Urban	1
Light Urban	2
Dense Suburban	3
Light Suburban	4
Rural	5
No Shielding	6

Length of Impact Area	
1/4 mile	1
20 seconds	2
15 seconds	3

Ldn 65 Contours Numeric Output (in feet)	
Existing 65 Ldn Contour at X-ing	413
Future 65 Ldn Contour at X-ing	413
Existing 65 Ldn Contour at 1/2 zone length	351
Future 65 Ldn Contour at 1/2 zone length	351
Zone Length	1320
1/2 Zone Length	660

Impact Zones Numeric Output (in feet)	
Impact Distance at X-ing	0
Severe Impact Distance at X-ing	0
Impact Distance at 1/2 zone length	0
Severe Impact Distance at 1/2 zone length	0
Zone Length	1320
1/2 Zone Length	660





Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: BNSF Stockton Sub Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	57	59
Source 1	44	45	30
Source 2	40	42	8
Source 3	62	54	56
Source 4	63	55	57
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	265	distance (ft)	265	distance (ft)	265	distance (ft)	265
Daytime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	50	speed (mph)	50
(7 AM - 10 PM)	trains/hour	0.933	trains/hour	0.933	trains/hour	0.4	trains/hour	0.4
	locos/train	1	cars/train	5	locos/train	4	length of cars (ft) / train	4000
Nighttime Hours	speed (mph)		speed (mph)		speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour		trains/hour		trains/hour	0.667	trains/hour	0.667
	locos/train		cars/train		locos/train	4	length of cars (ft) / train	4000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: BNSF Stockton Past Port Chicago Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	57	59
Source 1	62	54	56
Source 2	63	55	57
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	265	distance (ft)	265		
Daytime Hours	speed (mph)	50	speed (mph)	50		
(7 AM - 10 PM)	trains/hour	0.4	trains/hour	0.4		
	locos/train	4	length of cars (ft) / train	4000		
Nighttime Hours	speed (mph)	50	speed (mph)	50		
(10 PM - 7 AM)	trains/hour	0.667	trains/hour	0.667		
	locos/train	4	length of cars (ft) / train	4000		
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: RPRC Chevron Lead Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	66	52
Source 1	64	65	52
Source 2	58	60	35
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	6	distance (ft)	6		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.2	trains/hour	0.2		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: RPRC Cutting Lead Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	66	52
Source 1	64	65	52
Source 2	58	60	35
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	6	distance (ft)	6		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	0.2	trains/hour	0.2		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: RPRC Harbor Lead Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	67	44
Source 1	64	66	44
Source 2	59	61	27
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	20	distance (ft)	20		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	1.4	trains/hour	1.4		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train	1	length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: RPRC LRT Lead Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	67	42
Source 1	64	66	42
Source 2	58	60	25
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Freight Locomotive	9	Freight Cars	10		
Distance (source to receiver)	distance (ft)	28	distance (ft)	28		
Daytime Hours	speed (mph)	10	speed (mph)	10		
(7 AM - 10 PM)	trains/hour	2.2	trains/hour	2.2		
	locos/train	1	length of cars (ft) / train	600		
Nighttime Hours	speed (mph)		speed (mph)			
(10 PM - 7 AM)	trains/hour		trains/hour			
	locos/train		length of cars (ft) / train			
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		
Jointed Track?	Y/N	n	Y/N	n		
Embedded Track?	Y/N	n	Y/N	n		
Aerial Structure?	Y/N	n	Y/N	n		
Barrier Present?	Y/N	n	Y/N	n		
Intervening Rows of of Buildings	number of rows	0	number of rows	0		

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: UP Martinez Sub Future East of Pinole

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	58	59
Source 1	53	51	45
Source 2	50	48	42
Source 3	61	52	54
Source 4	63	54	57
Source 5	46	38	40
Source 6	44	36	38
Source 7	41	41	30
Source 8	35	37	8

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	230	distance (ft)	230	distance (ft)	230	distance (ft)	230
Daytime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	40	speed (mph)	40
(7 AM - 10 PM)	trains/hour	2.733	trains/hour	2.733	trains/hour	0.4	trains/hour	0.4
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Nighttime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	40	speed (mph)	40
(10 PM - 7 AM)	trains/hour	0.667	trains/hour	0.667	trains/hour	0.667	trains/hour	0.667
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Source 1 and 2 = Amtrak San Joaquin and Capitol Corridor
Source 3 and 4 = Freight trains
Source 5 and 6 - Amtrak Coast Starlight
Sources 7 and 8 - Amtrak California Zephyr

Source 5		Source 6		Source 7		Source 8	
Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Commuter Diesel Locomotive	2	Commuter Rail Cars	3
distance (ft)	230	distance (ft)	230	distance (ft)	230	distance (ft)	230
speed (mph)	50	speed (mph)	50	speed (mph)	50	speed (mph)	50
trains/hour	0.067	trains/hour	0.067	trains/hour	0.133	trains/hour	0.133
locos/train	2	cars/train	13	locos/train	2	cars/train	8
speed (mph)	50	speed (mph)	50	speed (mph)		speed (mph)	
trains/hour	0.111	trains/hour	0.111	trains/hour		trains/hour	
locos/train	2	cars/train	13	locos/train		cars/train	
	0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: UP Martinez Sub Future South of Pinole

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	58	59
Source 1	51	49	43
Source 2	50	48	42
Source 3	60	52	54
Source 4	63	55	57
Source 5	44	36	38
Source 6	44	36	38
Source 7	39	39	29
Source 8	35	37	7

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	285	distance (ft)	285	distance (ft)	285	distance (ft)	285
Daytime Hours	speed (mph)	60	speed (mph)	60	speed (mph)	50	speed (mph)	50
(7 AM - 10 PM)	trains/hour	2.733	trains/hour	2.733	trains/hour	0.4	trains/hour	0.4
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Nighttime Hours	speed (mph)	60	speed (mph)	60	speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour	0.667	trains/hour	0.667	trains/hour	0.667	trains/hour	0.667
	locos/train	1	cars/train	5	locos/train	3	length of cars (ft) / train	5000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Source 1 and 2 = Amtrak San Joaquin and Capitol Corridor
Source 3 and 4 = Freight trains
Source 5 and 6 - Amtrak Coast Starlight
Sources 7 and 8 - Amtrak California Zephyr

Source 5		**Source 6**		**Source 7**		**Source 8**	
Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Commuter Diesel Locomotive	2	Commuter Rail Cars	3
distance (ft)	285	distance (ft)	285	distance (ft)	285	distance (ft)	285
speed (mph)	60	speed (mph)	60	speed (mph)	60	speed (mph)	60
trains/hour	0.067	trains/hour	0.067	trains/hour	0.133	trains/hour	0.133
locos/train	2	cars/train	13	locos/train	2	cars/train	8
speed (mph)	60	speed (mph)	60	speed (mph)		speed (mph)	
trains/hour	0.111	trains/hour	0.111	trains/hour		trains/hour	
locos/train	2	cars/train	13	locos/train		cars/train	
	0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
Y/N	n	Y/N	n	Y/N	n	Y/N	n
number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Adminstration General Transit Noise Assessment
Developed for Chicago Create Project
Copyright 2006, HMMH Inc.
Case: UP Tracy Sub Future

RESULTS			
Noise Source	**Ldn (dB)**	**Leq - daytime (dB)**	**Leq - nighttime (dB)**
All Sources	65	60	59
Source 1	44	45	29
Source 2	40	42	7
Source 3	59	54	53
Source 4	64	59	58
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	**Source 1**		**Source 2**		**Source 3**		**Source 4**	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	270	distance (ft)	270	distance (ft)	270	distance (ft)	270
Daytime Hours	speed (mph)	50	speed (mph)	50	speed (mph)	50	speed (mph)	50
(7 AM - 10 PM)	trains/hour	0.933	trains/hour	0.933	trains/hour	0.467	trains/hour	0.467
	locos/train	1	cars/train	5	locos/train	4	length of cars (ft) / train	10000
Nighttime Hours	speed (mph)		speed (mph)		speed (mph)	50	speed (mph)	50
(10 PM - 7 AM)	trains/hour		trains/hour		trains/hour	0.333	trains/hour	0.333
	locos/train		cars/train		locos/train	4	length of cars (ft) / train	10000
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	n	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

SOURCE REFERENCE LIST	
Source	**Number**
Commuter Electric Locomotive	1
Commuter Diesel Locomotive	2
Commuter Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Freight Locomotive	9
Freight Cars	10
Hopper Cars (empty)	11
Hopper Cars (full)	12
Crossover	13
Automobiles	14
City Buses	15
Commuter Buses	16
Rail Yard or Shop	17
Layover Tracks	18
Bus Storage Yard	19
Bus Op. Facility	20
Bus Transit Center	21
Parking Garage	22
Park & Ride Lot	23

Appendix 5.16-1 Vehicle Miles Traveled (VMT) Analysis Methodology and Results for the Contra Costa County General Plan Update Memorandum

Appendices

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FEHR PEERS

Memorandum

Date: June 2, 2023

To: Tanya Sundberg, PlaceWorks

From: Julie Morgan and Bruno Lertora, Fehr & Peers

Subject: Vehicle Miles Traveled (VMT) Analysis Methodology and Results for the Contra Costa County General Plan Update

WC18-3554

This memorandum presents the results of the transportation analysis prepared for the proposed Contra Costa County General Plan 2045, herein referred to as the Project, in Contra Costa County, California. The purpose of this memorandum is to present the methodology and results of the VMT analysis for the Project.

Project Characteristics

The Contra Costa County General Plan 2045 includes proposed changes in housing units and employment in unincorporated areas throughout the County. **Table 1** shows a summary of the proposed land use changes within each subarea of unincorporated Contra Costa County (the subareas are as defined in the Contra Costa Countywide Travel Demand Model). The lead consultant for the General Plan (PlaceWorks) provided data to Fehr & Peers that reflected the location and magnitude of the proposed land use changes. Please see the EIR for a detailed description of the Project.

Table 1: Proposed Land Use Changes by County Subarea

Subarea	Proposed Land Use Change in Unincorporated Contra Costa County, 2020-2045		
	Single Family Units	Multi-Family Units	Employees
Central	1,235	3,670	2,685
East	4,193	4,851	2,962
Tri-Valley	673	107	-
West	970	7,489	3,749
Total	**7,071**	**16,117**	**9,396**

Source: Placeworks; Fehr & Peers 2023.

Vehicle Miles Traveled Analysis

The California Environmental Quality Act (CEQA) Guidelines were updated in December 2019 per Senate Bill 743 (SB 743) to remove consideration of vehicle delay or Level of Service (LOS) from CEQA analysis and to require the use of Vehicle Miles Traveled (VMT) as a metric to evaluate a project's environmental impact on the transportation system. VMT measures the amount of driving generated by the project and is related to a variety of environmental effects that are linked to the usage of motor vehicles. SB 743 changes the focus of transportation impact analysis in CEQA from measuring *impacts on drivers* to measuring the *environmental impact of driving*.

The relevant CEQA Guidelines Appendix G Transportation Section checklist questions are:

Would the project:

a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
d. Result in inadequate emergency access?

Criterion B is the formal implementation of the SB 743 requirement to analyze VMT as part of the CEQA Transportation section. The relevant subsection of CEQA Guidelines section 15064.3(b) reads as follows:

(1) **Land Use Projects.** Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle

miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

(4) **Methodology.** A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

As noted in subsection (4), Contra Costa County, under its discretion as lead agency, has the authority to select the analysis methodology and CEQA significance criteria for use in the Transportation section of the General Plan Update EIR. Contra Costa County prepared and adopted the *Contra Costa County Transportation Analysis Guidelines* (the "Guidelines") in June 2020, which contains the County's recommended procedures for conducting VMT analysis. These Guidelines are primarily focused on the analysis requirements for individual, site-specific land use projects; however, some of the concepts contained in the Guidelines can be applied to larger scale land use plans such as the General Plan, as further described below.

Project Screening

In the County's Guidelines, there are four screening criteria that can be applied to screen projects out of conducting a full VMT analysis.

1. **Small Projects.** Projects that generate or attract fewer than 110 daily vehicle trips, or projects of 10,000 square feet or less of non-residential space or 20 residential units or less or otherwise generating less than 836 VMT per day.
2. **Projects Located in Transit Priority Areas (TPAs).** Residential, retail, office projects, or mixed-use projects, proposed within ½ mile of an existing major transit stop or an existing stop along a high-quality transit corridor.
3. **Projects Located in Low VMT Areas.** Residential projects at 15% or below the baseline County-wide home-based average VMT per capita, or employment projects at 15% or below the baseline Bay Area average commute VMT per employee in areas with low VMT that incorporate similar VMT reducing features (i.e., density, mix of uses, transit accessibility).
4. **Public Facilities.** Public facilities (e.g., emergency services, passive parks (low-intensity recreation, open space), libraries, community centers, public utilities) and government buildings.

As described above, these Guidelines are primarily focused on analyzing the effects of individual, site-specific land use projects, and the screening criteria are designed as such. The proposed

General Plan is a long-range and large-scale plan that will affect land uses of a wide range of sizes and types, in a range of locations throughout the unincorporated County, and over a long planning horizon. As such, the General Plan Project does not fit within any of the above screening criteria and thus requires a full VMT assessment.

VMT Analysis Methodology

As described in the Guidelines, VMT should be estimated using the Contra Costa Countywide Travel Demand Model that is maintained by the Contra Costa Transportation Authority (often referred to as the CCTA Model). The CCTA Model allows analysts to forecast regional and local travel behavior as a function of local land use development decisions, transportation network infrastructure planning, and land use and network policies. The currently available CCTA Model reflects data included in Plan Bay Area 2040 and has a horizon year of 2040. Although the Bay Area Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) was recently updated with adoption of Plan Bay Area 2050, the currently available CCTA Model is still the best available tool for analysis of VMT impacts in Contra Costa County as it has the greatest level of detail of land uses and transportation facilities throughout the County.

The basic method is to insert the proposed project into the CCTA model and apply the model to determine both the trip generation and trip lengths of the vehicle trips associated with the proposed project. This calculation is done in the Model via the production and attraction trip matrices to be able to attribute automobile vehicle trips to the land use that generates the trip. The CCTA Model accounts for all trips within the nine-county Bay Area, and accounts for trips between the Bay Area and neighboring regions.

As described earlier in this memo, the location and magnitude of the residential and employment changes anticipated as a result of the proposed General Plan Update were provided by PlaceWorks and were incorporated into the CCTA model. As directed by the consultant team, the CCTA model was applied for two different scenarios and VMT calculations were prepared for each one:

- **Baseline No Project:** VMT was calculated using the year 2020 CCTA Model. This scenario serves as the baseline or point of comparison for environmental impact determinations related to the 2045 General Plan scenario.
- **Cumulative Plus Project:** VMT was calculated using the year 2045 CCTA Model with the Project's land use changes added to the appropriate transportation analysis zones (TAZs). The horizon year of the CCTA model available at the time this analysis was conducted was 2040. To create a year 2045 scenario, land use in the areas outside of unincorporated Contra Costa County was extrapolated based on the 2020 and 2040 data sets from the available CCTA model. Further, the recently-adopted Plan Bay Area 2050 was checked to see if additional transportation network enhancements were planned in Contra Costa

between 2040 and 2045 and that information was used to update the 2040 CCTA Model roadway network to reflect anticipated year 2045 conditions.

Policy Considerations

Contra Costa County has a Transportation Demand Management (TDM) ordinance and guidelines[1] to encourage project developers to use creative and effective ways to reduce motor vehicle trips and their associated impacts. The ordinance requires that all residential projects containing 13 or more dwelling units provide information to the residents about public transit, ridesharing, and active transportation options available in the vicinity of the project. Both residential and non-residential project developers are required to consult with the local transit provider about any needed infrastructure to connect the project with nearby transit services. Further, the guidelines present a range of potential TDM measures that project developers can consider, ranging from physical improvements that would be incorporated into the project's design (such as bike racks, traveler information kiosks, or pedestrian facilities linking the project site to a nearby transit stop) or operational programs that would be implemented once the project is occupied (such as providing transit or rideshare incentives).

The County is developing an updated Climate Action Plan (CAP) to guide its approach to reducing greenhouse gas emissions countywide. The CAP includes a VMT reduction strategy and several associated implementation actions that are aimed toward reducing motor vehicle travel and associated emissions. Strategy TR-1 is to "Improve the viability of walking, biking, zero-carbon commuting, and using public transit for travel within, to, and from the county;" the implementation actions associated with that strategy are to:

- Track over time projects that add pedestrian and bicycle facilities to document the County's implementation of the County Road Improvement and Preservation Program (CRIPP); Complete Streets checklist; Vision Zero Report; Active Transportation Plan; and equity-focused plans, programs, and policies.
- Improve the safety and comfort of bicycle, pedestrian, and public transit facilities using best practices to encourage more people to use such facilities.
- Work with CCTA to fill gaps in the countywide Low Stress Bike Network, as outlined in the 2018 Countywide Bicycle and Pedestrian Plan. Prioritize providing access for Impacted Communities and constructing protected bike facilities.
- Establish or join a shared mobility program that provides access to conventional bikes, e-bikes, and other micromobility modes.
- Support efforts to expand the service area and frequency of regional transit agencies, including AC Transit, BART, Capitol Corridor, County Connection, Tri Delta Transit, the San Francisco Bay Ferry, and WestCAT.

[1] Contra Costa County Transportation Demand Management Ordinance Guide, December 2009, https://www.contracosta.ca.gov/DocumentCenter/View/50168/TDM-Ordinance-Guide---FINAL, accessed June 1, 2023.

- Maximize development of jobs and affordable housing near high-quality transit service to support a jobs-housing balance.
- Market the county's Northern Waterfront to attract innovative companies with jobs for residents.
- Require large residential, nonresidential, and mixed-use developments to participate in Transportation Demand Management strategies, including providing shuttle services between residential developments or employment centers and key transit centers, providing nonmotorized transportation options, offering telecommuting opportunities, and encouraging use of pre-tax commute benefits.
- Improve county-wide safety for cyclists by advocating for the passage of Vulnerable Road User Laws.
- Secure additional funding for the maintenance and expansion of bicycle, pedestrian, and public transit operations and infrastructure improvements.
- Coordinate with CCTA to develop and implement methods for tracking EV and e-bike charging and availability across jurisdictions.
- Support CCTA and regional transit agencies in providing "last mile" transportation connections and options.
- Encourage and support increased regional integration of transit systems to promote more equitable fare structures, fare integration, easier transfers, including coordinated transfers between different transit systems and reduced wait times, improved information sharing, and generally a more seamless and modern system.

The TDM measures and VMT reduction strategies described above can be effective at reducing the VMT generated by individual developments when implemented in appropriate locations and with appropriate supporting resources, as noted in the statewide guidance on TDM effectiveness: California Air Pollution Control Officers Association's (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity.[2] Because this Project is a General Plan Update that will guide long-range development over a broad geographic area, it is not possible to predict with precision which strategies may be implemented at specific locations and at specific times. Further, the CCTA Model does not readily account for many of these measures, particularly those related to site-specific physical improvements, pedestrian and bicycle facilities, and ongoing operational or incentive programs. For those reasons, the potential effects of the TDM and VMT reduction strategies outlined in this section are not included in the VMT estimates presented here.

VMT Metrics

The County's Guidelines present several forms of VMT metrics that can be used to evaluate the impacts of a project. For example, it is recommended that residential projects use a metric of VMT per resident for all home-based trips, while employment projects use a metric of VMT per

[2] California Air Pollution Control Officers Association's (CAPCOA) Handbook, December 2021. Available at: https://www.airquality.org/ClimateChange/Documents/Final%20Handbook_AB434.pdf, accessed September 20, 2022.

employee for only the home-based-work trip purpose. Mixed-use projects are recommended to use a metric of total VMT per service population (where service population is the summation of residential population and employment).

Because this Project is a General Plan Update that will involve land development of many different types, sizes, and locations, the metric of total VMT per service population was determined to be the most appropriate for this analysis, as it captures all trip purposes from all types of development.

VMT Thresholds

The County's Guidelines present thresholds of significance that can be used to determine the significance of a project's VMT impacts. The basic threshold is that a project's VMT metric be at least 15% below a specific point of comparison. The point of comparison varies depending on the type of project: for residential projects, the point of comparison is the countywide average home-based VMT per capita, while for employment projects the point of comparison is the Bay Area regional average commute VMT per employee. For mixed-use projects, the threshold is that the project's total VMT per service population be at least 15% below the countywide average VMT per service population.

VMT Results

Results from the two CCTA model scenarios described above are presented in **Table 2**.

Table 2: Summary of VMT Results

Boundary	Project Area Values	Baseline (2020) No Project	Cumulative (2045) Plus Project
Unincorporated Contra Costa County	Total VMT	6,764,785	8,130,277
	Service Population[1]	203,484	274,311
	Total VMT per Service Population	33.2	29.6
Contra Costa County (combined incorporated and unincorporated areas)	Total VMT	40,148,708	48,504,298
	Service Population[1]	1,360,651	1,712,018
	Total VMT per Service Population	29.5	28.3

Source: Contra Costa Countywide Travel Demand Model; Fehr & Peers 2023.
Notes:
1. Service Population is defined as the sum of residential population and employment.

Please contact us with any questions.