

DRAFT ENVIRONMENTAL IMPACT REPORT

Chalk Hill Road Bridge Replacement

Sonoma County, California

SCH#2025040225



PUBLIC INFRASTRUCTURE — SONOMA COUNTY

wra
Environmental Consultants

PREPARED BY WRA, INC.

September 18, 2026

Chalk Hill Road Bridge Replacement (SCH #2025040225)

Draft Environmental Impact Report

Sonoma County, California

Prepared for:

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List of Acronyms

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ADT	average daily traffic
ADI	Area of Direct Impact
ADU	Accessory Dwelling Unit
ALS	advanced life support
APE	Area of Potential Effects
APN	Assessor's Parcel Number
AR	Agriculture and Residential
ARM	Aggregate Resources Management
Air District	Bay Area Air District
BA	Biological Assessment
BMPs	best management practices
BSA	Biological Study Area
Btu	British thermal units
C&D	construction and demolition
CalEEMod	California Emissions Estimator Model
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
California Register	California Register of Historic Resources
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CalOES	California Office of Emergency Services
CARB	California Air Resources Board
CBC	California Building Code
CC	California coastal
CCC	Central California Coast
CCR	Code of Regulations
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CEC	California Energy Commission
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CGS	California Geological Survey
CH_4	methane
CIDH	cast-in-drilled-hole
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society

CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
ColWMP	Countywide Integrated Waste Management Plan
CPUC	California Public Utilities Commission
CVEMSA	Coastal Valleys EMS Agency
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
DA	Diverse Agriculture
dB	decibel
dBA	A-weighted decibel
DMA	Disaster Mitigation Act
DOF	Department of Finance
DOT	Department of Transportation
DPI	Department of Public Infrastructure
DPM	diesel particulate matter
DPS	Distinct Population Segment
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EAP	Energy Action Plan
EIA	Energy Information Association
EIR	Environmental Impact Report
EMS	Emergency medical services
EO	Executive Order
EPA	Environmental Protection Agency
EPACT92	National Energy Policy Act of 1992
ESA	Endangered Species Act
ESU	evolutionary significant unit
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
FMP	Fishery Management Plan
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
FYLF	Foothill yellow-legged frog
GHG	greenhouse gas
GSAs	Groundwater Sustainability Agencies
GSPs	Groundwater Sustainability Plans
GWh	gigawatt-hours
HA	Hydrological Area
HAER	Historic American Engineering Record
HCD	Housing and Community Development
HCP	Habitat Conservation Plan
HD	Historic District
HMA	hot mix asphalt
HMGP	Hazard Mitigation Grant Program
HSU	Hydrological Sub-Area
HU	Hydrological Unit
HWCL	Hazardous Waste Control Law

Hz	Hertz
ICS	Incident Command System
IOUs	investor-owned utilities
IPCC	Intergovernmental Panel on Climate Change
in/sec	inches per second
kHz	kilohertz
LAFCO	Local Agency Formation Commission
L_{dn}	day-night average noise level
L_{eq}	equivalent noise level
L_{max}	maximum noise level
L_{xx}	Percentile-Exceeded Sound Level
LEA	Land Extensive Agriculture
LEED	Leadership in Energy and Environmental Design
LIA	Land Intensive Agriculture
LID	Manual Low Impact Development Technical Design Manual
LRA	Local Responsibility Area
LSA	Lake and Streambed Alteration
LSAA	Lake or Streambed Alteration Agreement
LUST	leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MEI	maximally exposed individual
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
$MMTCO_2E$	million metric tons of carbon dioxide equivalent
mPa	micro-Pascals
MR	Mineral Resources
MSATs	mobile source air toxics
MS4	Municipal Separate Storm Sewer System
MTC	Metropolitan Transportation Commission
MUTCD	Manual on Uniform Traffic Control Devices
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
National Register	National Register of Historic Places
NCRWQCB	North Coast Regional Water Quality Control Board
NES	Natural Environment Study
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NoSoCo Air District	Northern Sonoma County Air Pollution Control District
NO_x	nitrogen oxides
NPDES	National Pollution Discharge Elimination System
NPT	Northwestern pond turtle
NRCS	Natural Resource Conservation Service
NSCFPD	Northern Sonoma County Fire Protection District
NSR	New Source Review
OAK	Oak Woodland

OHWM	ordinary high-water mark
OSRC	Open Space and Resource Conservation
PG&E	Pacific Gas & Electric Company
PM	particulate matter
$PM_{2.5}$	fine particulate matter
PM_{10}	course (respirable) particulate matter
Porter-Cologne Act	California Porter-Cologne Water Quality Control Act
PPV	peak particle velocity
PRC	Public Resources Code
PRMD	Permit and Resource Management Department
PRMMP	Paleontological Resource Mitigation and Monitoring Program
Rank	California Rare Plant Rank
RC	Riparian Corridor
RCNM	Roadway Construction Noise Model
RCPA	Regional Climate Protection Authority
RCRA	Resource Conservation and Recovery Act
RHNA	Regional Housing Needs Assessment
RHRP	Revegetation and Habitat Restoration Plan
ROG	reactive organic gas
RRIHM	Russian River Integrated Hydrologic Model
RSP	rock slope protection
Rules	Air Quality Control Rules
RWQCB	Regional Water Quality Control Board
SAF Plan	State Alternative Fuels Plan
SAFE	Safer Affordable Fuel-Efficient
SB	Senate Bill
SCFD	Sonoma County Fire District
SCP	Sonoma Clean Power
SCSs	Sustainable Communities Strategies
SCTA	Sonoma County Transportation Authority
SDWA	Safe Drinking Water Act
SEMS	Standardized Emergency Management System
SGMA	Sustainable Groundwater Management Act
SHMP	State of California Multi-Hazard Mitigation Plan
SMARA	Surface Mining and Reclamation Act
SMART	Sonoma-Marin Area Rail Transit
Sonoma Water	Sonoma County Water Agency
SPL	sound pressure level
SR	Scenic Resource
SRA	State Responsibility Areas
SSC	Species of Special Concern
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TMDL	total maximum daily loads
TPW	Transportation and Public Works
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMPs	Urban Water Management Plans
VMT	vehicle miles traveled
VOCs	volatile organic compound
VOH	Valley Oak Habitat
WDRs	waste discharge requirements
WEAP	Worker Environmental Awareness Program
WMP	Waste Management Plan
WRA	WRA, Inc.
WUI	Wildland-Urban Interface

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EXECUTIVE SUMMARY

Pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15123, this summary provides information about the Environmental Impact Report (EIR) prepared by Sonoma County Department of Public Infrastructure (DPI) for the proposed replacement of the Chalk Hill Road Bridge. This section summarizes the characteristics of the proposed Project, alternatives to the proposed Project, and the environmental impacts and mitigation measures associated with the proposed Project.

Project Synopsis

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Project Description Summary

This EIR has been prepared to examine the potential environmental effects of replacement of the existing bridge on Chalk Hill Road over Maacama Creek. The following is a summary of the full Project description, which can be found in *Section 2.0, Project Description*.

PROJECT LOCATION

The Project site is located in the Alexander Valley region of northeastern Sonoma County, approximately 75 miles north of San Francisco. The 6.38-acre Project site is located along Chalk Hill Road approximately 1.25 miles south of State Route 128 within the eastern portion of Sonoma County. The Project site includes portions of Chalk Hill Road, Maacama Creek, and surrounding parcels. The Project site also includes an existing one-lane bridge that carries Chalk Hill Road over Maacama Creek, which is a historical landmark eligible for inclusion on the National Register of Historic Places due to its age and unique character. The bridge is also recognized as a local landmark by the Sonoma County Landmarks Commission. The bridge corridor provides access from communities such as Windsor, Mark West Springs, Larkfield-Wikiup and Santa Rosa via U.S. Highway 101, and connects them to the rural, agricultural areas of Alexander Valley.

The Project site has a General Plan land use designation of Land Intensive Agriculture. The zoning designation is LIA (Land Intensive Agriculture) with a Scenic Resource (SR) combining zone along Chalk Hill Road, a Riparian Corridor (RC 100/50) and Oak Woodland (OAK) combining zone along Maacama Creek, and Historic District (HD) along the Chalk Hill Road bridge.

PROJECT OBJECTIVES

The existing Chalk Hill Road bridge is at risk of collapse from earthquakes and landslides and is scour critical. The purpose of the Chalk Hill Road Bridge Replacement Project (Project, proposed Project) is to ensure safe crossing for vehicles, bicyclists, and pedestrians over Maacama Creek by replacing the existing bridge.

Project objectives include the following:

1. Ensure safe crossing for vehicles, bicyclists, and pedestrians along Chalk Hill Road over Maacama Creek by replacing or rehabilitating the existing bridge.
2. Satisfy the requirements of California's Local Bridge Seismic Retrofit Program to protect the traveling public from earthquake related hazards.
3. Satisfy the requirements of the Federal Highway Administration's Highway Bridge Program and ensure the Project meets the civil, traffic, environmental, structural, and safety standards therein.
4. Reduce the potential for scour and erosion at bridge foundations to improve long-term structural stability and resilience during high-flow events.

PROJECT DESIGN

The County proposes to remove the existing one-lane substandard bridge and replace it with a two-lane bridge built on an alternate alignment. The replacement bridge would be located downstream (west) of the existing bridge, crossing the creek with a single-span concrete box girder supported by reinforced concrete abutments. The replacement bridge would have two 11-foot lanes and two 4-foot shoulders for a total clear roadway width of 30 feet. The proposed 30-foot total clear roadway width meets minimum American Association of State Highway and Transportation Officials (AASHTO) lane and shoulder width standards for an average daily traffic (ADT) count of 400 to 1,500 trips and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed use.

Retaining structures would be built along the west side of the bridge at the north approach roadway to minimize the take of farmland for new right-of-way, and at the south approach roadway to minimize the extent of embankment fill. Additionally, scour countermeasures, such as vegetated rock slope protection and large logs with root wads, would be installed to stabilize the south creek bank and to protect the new replacement bridge. The existing bridge would be removed following completion of the new bridge.

The majority of the proposed right-of-way for bridge replacement work is located within Assessor's Parcel Number (APN) 132-080-023, with small portions crossing into APNs 132-060-013, 132-080-022, 132-060-011 and 132-080-003. Construction staging areas occur in APNs 132-060-013, 132-080-022, and 132-080-017.

PROJECT CONSTRUCTION

The Project would be constructed in two construction seasons. The replacement bridge would be built and put into service during the first construction season. The existing bridge would remain open during the first construction season to maintain traffic. Once the new bridge is completed, traffic would be switched onto the new bridge. Demolition of the existing bridge and installation of permanent scour countermeasures would occur during the second construction season.

Work below the top of the creek bank would be limited to the dry season per construction windows specified by applicable regulatory permits. The creek channel is expected to have minimal flow throughout the construction season, requiring only a minor diversion of the creek flow. Work on the new bridge approach roadways may occur at any time so long as water quality protections are implemented.

Unless otherwise specified in applicable permits or the contract specifications, construction hours would be limited to 7 a.m. to 7 p.m. on weekdays, and 9 a.m. to 7 p.m. on weekends and holidays.

Alternatives

As required by CEQA, this EIR examines alternatives to the proposed Project. Studied alternatives include the two alternatives described in the following sections. Section 15126.6 of the CEQA Guidelines requires that an "environmentally superior" alternative be selected and the reasons for such a selection disclosed. It was determined that Alternative 1: No Project would be the environmentally superior alternative. However, Section 15126.6(e)(2) of the CEQA Guidelines requires that if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. In this case, the proposed Project would be considered environmentally superior to Alternative 2: Retain Existing Bridge.

Alternative 1: No Project

Under the No Project Alternative, the existing bridge would remain in place, and no rehabilitation or replacement of the bridge would occur. Alternative 1 would result in the continued use of the existing bridge until the bridge potentially succumbs to collapse.

Alternative 2: Retain Existing Bridge

Under Alternative 2, Retain Existing Bridge, a new bridge would be built parallel to and downstream of the existing bridge, and the existing bridge would be left in place. The new bridge would be used for vehicular travel and the existing bridge would be used for pedestrian and bicycle travel. With pedestrian and bicyclist use of the existing bridge, public safety must be maintained, and therefore this alternative would require some degree of retrofit to the existing bridge.

Areas of Known Controversy

State CEQA Guidelines Section 15123(b) requires that a summary section include a description of areas of controversy known to the lead agency, including issues raised by agencies and the public, and issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant impacts. Known areas of controversy include the removal of a historic resource, the Chalk Hill Road bridge.

Responses to the Notice of Preparation of a Draft EIR and input received at the EIR scoping meeting held by the County are summarized in *Section 1, Introduction*.

Summary of Impacts and Mitigation Measures

Table ES-1 summarizes the environmental impacts of the proposed Project, proposed mitigation measures, and residual impacts (the impact after application of mitigation, if required). Impacts are categorized as follows:

1. **Significant and Unavoidable Impact:** An impact that cannot be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the Project is approved per CEQA Guidelines 15091.
2. **Less-than-Significant Impact with Mitigation Incorporated:** An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires findings under CEQA Guidelines Section 15091.
3. **Less-than-Significant Impact:** An impact that may be adverse but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.
4. **No Impact:** The proposed Project would have no effect on environmental conditions or would reduce existing environmental problems or hazards.

Table ES-1. Summary of Impacts and Mitigation Measures

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
AESTHETICS		
Impact AES-1: The Project would not have a substantial adverse effect on a scenic vista.	None required.	*Less-than-Significant Impact*
Impact AES-2: The Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	None required.	*No Impact*
Impact AES-3: The Project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings in a non-urbanized area.	None required.	*Less-than-Significant Impact*
Impact AES-4: The Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	None required.	*No Impact*
AGRICULTURAL AND FORESTRY RESOURCES		
Impact AG-1: The Project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.	None required.	*Less-than-Significant Impact*
Impact AG-2: The Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract.	None required.	*Less-than-Significant Impact*
Impact AG-3: The Project would conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland(as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	None required.	*No Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact AG-4: The Project would not result in loss of forest land or conversion of forest land to a non-forest use.	None required.	*No Impact*
Impact AG-5: The Project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.	None required.	*No Impact*
AIR QUALITY		
Impact AIR-1: The Project would not conflict with or obstruct implementation of the applicable air quality plan.	None required.	*Less-than-Significant Impact*
Impact AIR-2: The Project would potentially result in a cumulatively considerable net increase of criteria pollutants for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?	**Mitigation Measure AIR-1: Fugitive Dust Controls** During any construction period ground disturbance, the contractor shall ensure that the following BMPs are implemented to control dust: • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • On-site dirt piles or other stockpiled materials shall be covered, wind breaks installed, or water and/or soil stabilizers employed to reduce wind-blown dust emissions. The use of approved nontoxic soil stabilizers shall be incorporated according to manufacturers' specifications to all inactive construction areas. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping should only be performed in conjunction with thorough watering of the subject roads. • All vehicle speeds on unpaved roads and surfaces shall be limited to 15 mph. • The construction contractor shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. • Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the total amount of disturbed surfaces at any one time. • All transfer processes involving a free fall of soil or other materials shall be operated in such a manner as to minimize the free fall distance and fugitive dust emissions. • Site access and staging area access routes to a distance of 100 feet from the paved road shall be treated with a 6- to12-inch compacted layer of wood chips, mulch, or gravel. • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. • Open burning shall be prohibited at the Project site. No open burning of vegetative waste (natural plant growth wastes) or other legal or illegal burn materials (e.g., trash, demolition debris) may be conducted at the Project site. Vegetative wastes shall be chipped or delivered to waste-to-energy facilities (permitted biomass facilities), mulched, composted, or used for firewood. It is unlawful to haul waste materials off-site for disposal by open burning.	
Impact AIR-3: The Project would potentially expose sensitive receptors to substantial pollutant concentrations during construction.	**Mitigation Measure AIR-2: Diesel Particulate Matter Exhaust** To mitigate potential cancer risks associated with Project construction, the Project proponent shall develop a plan demonstrating that the off-road equipment used on-site to construct the Project would achieve a fleet-wide average 72	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	percent reduction in DPM exhaust emissions or greater. One feasible plan to achieve this reduction would include the following: • All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 4 Final engines. Where Tier 4 equipment is not available, exceptions could be made for equipment that includes CARB-certified Level 3 Diesel Particulate Filters or equivalent. Equipment that is electrically powered or uses non-diesel fuels would also meet this requirement. • Idling time of diesel-powered construction equipment and trucks would be limited to no more than two minutes. Clear signage of this idling restriction would be provided for construction workers at all access points. • The primary contractor shall be responsible for ensuring that all construction equipment is properly tuned and maintained before and for the duration of on-site operation. • Where accessible, existing power sources (e.g., power poles) or clean-fuel generators shall be used rather than temporary power generators.	
Impact AIR-4: The Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	None required.	*Less-than-Significant Impact*
BIOLOGICAL RESOURCES		
Impact BIO-1: The Project would have a potentially significant impact related to having a substantial adverse effect, either directly or through habitat modifications, on any species identifies as a candidate, sensitive, or special status species in	**Mitigation Measure BIO-1. Day Roosting Bats** To the extent feasible, any tree removal or trimming shall be conducted outside of the bat maternity season (generally April through October). If this work window is not feasible, preconstruction bat roost assessments shall be conducted by a qualified biologist at least 14 days and no more than 30 days	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
local or regional plans, policies, or regulations, or by the CDFW or USFWS.	prior to removal of trees or vegetation. If special-status bat species or maternity roosts are detected during these surveys, additional measures including avoidance of the roost sites until the end of the maternity roosting season shall be recommended by the qualified biologist. Regardless of the timing of tree removal or trimming activities, all felled trees or large limbs shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any roosting individual bats to vacate the premises of their own volition. **Mitigation Measure BIO-2: Pre-construction Nesting Bird Surveys** If construction activities for the Project begin between February 1 and August 31, pre-construction surveys within the Project site shall be conducted by a qualified biologist prior to vegetation or tree removal and to determine whether active nests containing eggs, chicks, or young are present. Pre-construction surveys for active nests will be conducted no more than 14 days prior to initial ground- or vegetation-disturbing activities. If active nests containing eggs, chicks, or young are not observed during pre-construction surveys, construction can proceed with no further mitigation measures. If active nests containing eggs, chicks, or young are observed, ground-disturbing activities shall be avoided within a 25- to 100-foot exclusion zone for passerine birds and a 200- to 500-foot exclusion zone for raptors and special-status species. Exclusion size will be dependent upon species and nest location and will be determined by a qualified biologist based on the species present and location of the nest relative to construction activities (e.g., the nest is sufficiently shielded from construction to avoid disturbance). Construction within this buffer shall be prohibited until the qualified biologist determines that the nest is no longer active. If an active nest is found after the completion	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	of the pre-construction surveys or after construction begins, all construction activities will stop until a qualified biologist has evaluated the nest and determined an appropriate buffer to be placed around the nest. If avoidance of a buffer zone is not feasible, CDFW will be contacted to coordinate an appropriate course of action. **Mitigation Measure BIO-3a. Special-status Amphibian Work Windows** All work within 100 feet of any wetted stream feature or associated riparian area shall be scheduled to occur during the dry season (between June 15 and October 15). Timing should also occur outside of the FYLF breeding season (March 1 to June 30). No work shall occur within 48-hours after a precipitation event. Work within the upland areas of the Project site may occur outside of this window. **Mitigation Measure BIO-3b. Special-status Amphibian Pre-Construction Surveys** Within 48 hours prior to the start of construction ork outside of any paved areas of the Project site, a pre-construction survey shall be conducted by a qualified biologist to determine whether the BSA has potential to support special-status amphibians during the time of construction. Surveys should cover at least 500 feet upstream and 500 feet downstream of the work area for presence of all life stages. If any special-status amphibians are observed, the qualified biologist will relocate the individual(s) outside of the work area to suitable habitat and in consultation with CDFW, recommend if a biological monitor is required, or if additional minimization measures shall be implemented. If surface water is present during construction, a qualified biologist shall inspect the work area daily prior to onset of construction activities for special-status amphibians.	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure BIO-3c. Special-status Amphibian Worker Environmental Awareness Training Members of all construction work crews that will work on the Project shall undergo a Worker Environmental Awareness Program (WEAP) training conducted by a qualified biologist, which will cover basic identification of all special-status amphibians and review recommended actions should any be discovered within the work area. **Mitigation Measure BIO-4. Pre-Construction Surveys for Northwestern Pond Turtle** Pre-Construction Surveys for the northwestern pond turtle should be performed within 24 hours of initiation of in-water Project activities. • If no NPT are observed, no monitoring is required. • If NPT are observed, the qualified biologist will relocate the individual(s) outside of the work area to suitable habitat and recommend if a biological monitor is required, or other minimization measures implemented, dependent upon work activities. Such measures may include a protective no-work buffer, exclusion fencing, monitoring, or coordination with CDFW if relocation is required. • If a biological monitor is not present, and a NPT is observed entering the work area, work will stop in the immediate vicinity and the qualified biologist notified to relocate the individual and assess if additional minimization measures should be implemented. **Mitigation Measure BIO-5. Fish Capture and Relocation Plan** A fish capture and relocation plan shall be prepared for the proposed Project and will be submitted to NMFS for approval no less than 30 days prior to construction. The plan shall be implemented to move fish and other aquatic life in the Project	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	site to a suitable location outside the Project site if streamflow and/or pools are present in the BSA during construction, and if work, including installation of the stream diversion system, would potentially affect aquatic species. At a minimum, the plan will include the following: • If flow is present, a fish capture and relocation operation shall be conducted prior to construction to remove fish and other aquatic species form the work site. Salmonids and other native species encountered shall be relocated safely to a location where suitable habitat is present. The stream shall be diverted into the temporary channel, and the work area dewatered and isolated from stream flow. • Fish capture and relocation shall be completed if flowing water or pools with potential to support fish remain in the proposed Project site at the time work in the creek bed occurs, and work activities will be implemented by a qualified biologist during dewatering activities in Maacama Creek. The fish capture and relocation plan will include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish capture and relocation during dewatering activities. • If dewatering is necessary, pumps with 0.1-inch mesh will be used to remove standing water from the work area within the cofferdams to a filtration basin to prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or be released through filter bags will prevent excessive turbidity or sediment loads during the dewatering process.	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact BIO-2: The Project would have a potentially significant impact related to having a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS.	**Mitigation Measure BIO-6. Perennial Stream Construction Measures** To avoid and reduce impacts to the perennial stream biological community, the following measures shall be implemented: • Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction shall be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas and to prevent any equipment from unnecessarily extending the work area or entering the creek bed. In addition, silt fencing will be installed where appropriate to prevent debris from entering the creek. All fencing will be removed upon Project completion. • To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment, spill control absorbent material will be placed underneath equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, must occur outside the creek's top-of-bank. Any hazardous chemical spills shall be cleaned immediately. • When working on the roadway and bridge approaches during the wet season, all drainage inlets within the proposed Project site will be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs. • The construction contractor shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from construction work are deposited in covered or closed trash containers. The trash containers will not be left open and unattended overnight. • During the year after construction, the proposed Project site will be inspected during the rainy season. Areas of	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	significant erosion or erosion control device failure will be noted and appropriate remedial actions taken. **Mitigation Measure BIO-7. Revegetation and Habitat Restoration Plan** The lead agency shall prepare a Revegetation and Habitat Restoration Plan (RHRP) prior to the initiation of ground disturbing activities. The RHRP shall be prepared by a qualified restoration ecologist or biologist. The RHRP shall use only locally appropriate, native plant species characteristic of the impacted habitat types. The RHRP shall describe seeding and planting techniques, seasonal timing of installation, irrigation (if needed), and protection measures (e.g., wildlife exclusion fencing, erosion control). The RHRP shall also establish quantitative success criteria, requirements for annual monitoring, and contingency measures if performance standards are not met within the monitoring period. Restoration activities shall commence within one growing season following completion of the second construction season. The lead agency shall oversee compliance with the RHRP, with technical support as needed from a qualified restoration specialist.	
Impact BIO-3: The Project would not have a substantial adverse effect on state or federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	None required.	*No Impact*
Impact BIO-4: The Project would have a potentially significant impact related to interfering substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	See **Mitigation Measure BIO-5. Fish Capture and Relocation Plan**	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact BIO-5: The Project would have a potentially significant impact related to conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	See the following mitigation measures: • **Mitigation Measure BIO-1. Day Roosting Bats** • **Mitigation Measure BIO-2: Pre-construction Nesting Bird Surveys** • **Mitigation Measure BIO-3a. Special-Status Amphibian Work Windows** • **Mitigation Measure BIO-3b. Special-Status Amphibian Pre-Construction Surveys** • **Mitigation Measure BIO-3c. Special-Status Amphibian Worker Environmental Awareness Training** • **Mitigation Measure BIO-4. Pre-Construction Surveys for Northwestern Pond Turtle** • **Mitigation Measure BIO-5. Fish Capture and Relocation Plan** • **Mitigation Measure BIO-6. Perennial Stream Construction Measures** • **Mitigation Measure BIO-7. Revegetation and Habitat Restoration Plan**	*Less-than-Significant Impact*
Impact BIO-6: The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approval local, regional, or state habitat conservation plan.	None required.	*No Impact*
CULTURAL RESOURCES		
Impact CUL-1: The Project would have a significant and unavoidable impact related to causing a substantial adverse changed in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.	**Mitigation Measure CUL-1. Chalk Hill Road Bridge Historic Recordation** Prior to commencement of any work that could adversely affect any characteristics that qualify the Chalk Hill Road Bridge as a historic property, the County shall create a three-dimensional scan of the bridge. The data shall be collected with a high-definition Terrestrial Laser Scanner, which will produce a complete point cloud of the bridge. This data shall be accurate to survey industry standards, and readily inserted into industry	*Significant and Unavoidable Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	standard 3D modeling software. The data shall be made available to the following organizations: Bridgehunter.com, Historicbridges.org, Sonoma County Historical Society, and the Sonoma County Landmarks Commission. Additionally, the data shall be made available to the public via the designated DPI Project website. The County, in collaboration with Caltrans District 4, shall develop a public webinar. The webinar will explore the history of the Chalk Hill Road Bridge and applicable themes. The webinar shall be delivered to the public and shall be made available via the designed DPI Project website. The County shall ensure that the 1915 construction plaque on the bridge is removed prior to demolition of the old bride. The County, in consultation with the Sonoma County Landmarks Commission, shall incorporate the plaque into the replacement bridge design in an area visible to the public. If incorporating the plaque into the new signage is not feasible, the County shall offer the plaque to a local museum, group, or repository willing and capable of curating the plaque. If no repository has been identified within three months of the initial offer, the County may dispose of the plaque.	
Impact CUL-2: The Project would have a potentially significant impact related to causing a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5	**Mitigation Measure CUL-2. Archaeological Resources** If buried materials are encountered during Project construction, all soil disturbing work shall be halted within the immediate vicinity of the discovery until a qualified archaeologist makes a significance evaluation of the find(s) pursuant to Section 106 of the NHPA (36CFR60.4). If the qualified archaeologist determines that the find is eligible for inclusion on the National or California Register, the archaeologist shall make recommendations for appropriate methods of treatment for the find, which shall be implemented by the lead agency. Potential treatment methods for resources may include, but would not be limited to, avoidance of the resource through changes in construction	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	methods or Project design or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. Any efforts shall be documented in a cultural resources report to be filed with the Northwest Information Center.	
Impact CUL-3: The Project would have a potentially significant impact related to disturbing any human remains, including those interred outside of dedicated cemeteries.	**Mitigation Measure CUL-3. Human Remains** Work shall halt within 50 feet if human remains are uncovered during construction. The significance of the find shall be assessed by a qualified archaeologist, and the appropriate management shall be pursued. California law recognizes the need to protect interred human remains, particularly Native American burials and items of cultural patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code §§ 7050.5 and 7052 and PRC § 5097. If remains are uncovered, the lead agency and the County coroner shall be notified immediately. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code § 7050.5[b]). If the coroner determines that the remains are those of a Native American, the coroner must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code § 7050[c]). The lead agency and the professional archaeologist shall contact the Most Likely Descendent, as determined by the NAHC, regarding the remains. The Most Likely Descendant, in cooperation with the lead agency, shall determine the ultimate disposition of the remains and any associated artifacts.	
ENERGY		
Impact EN-1: The Project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of	None required.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
energy resources, during Project construction or operation.		
Impact EN-2: The Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	None required.	*Less-than-Significant Impact*
GEOLOGY AND SOILS		
Impact GEO-1a: The Project site would not directly or indirectly cause potential substantial adverse effects involving rupture of a known earthquake fault.	None required.	*No Impact*
Impact GEO-1b: The Project would not cause substantial adverse effects associated with strong seismic ground shaking.	None required.	*Less-than-Significant Impact*
Impact GEO-1c: The Project would not cause substantial adverse effects associated with seismic-related ground failure, including liquefaction.	None required.	*Less-than-Significant Impact*
Impact GEO-1d: The Project would not cause substantial adverse effects associated with landslides.	None required.	*Less-than-Significant Impact*
Impact GEO-2: The Project would not result in substantial soil erosion or the loss of topsoil during construction or operation.	None required.	*Less-than-Significant Impact*
Impact GEO-3: The Project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.	None required.	*Less-than-Significant Impact*
Impact GEO-4: The Project would not be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code, creating substantial direct or indirect risks to life or property.	None required.	*Less-than-Significant Impact*
Impact GEO-5: The Project would not involve the use of septic tanks or alternative wastewater disposal systems.	None required.	*No Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact GEO-6: The Project would potentially directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Mitigation Measure GEO-1: Paleontological Review of Project Plans** The Project applicant shall retain a Qualified Professional Paleontologist to review proposed ground disturbance associated with development to: 1. Assess if the Project will require paleontological monitoring; 2. If monitoring is required, to develop a Project-specific Paleontological Resource Mitigation and Monitoring Program (PRMMP) as outlined in Mitigation Measure GEO-2; 3. Draft the Paleontological Worker Environmental Awareness Program as outlined in Mitigation Measure GEO-3; and 4. Define within a Project-specific PRMMP under what specific ground disturbing activity paleontological monitoring will be required and what procedures for collection and curation of recovered fossils, as described in Mitigation Measure GEO-4, GEO-5, and GEO-6. The assessment of monitoring requirements will be established by the Qualified Paleontologist and will be based on the location and depth of ground disturbing activity in the context of paleontological potential and potential impacts. A Qualified Professional Paleontologist is defined by the SVP standards as an individual preferably with an M.S. or Ph.D. in paleontology or geology who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as a paleontological mitigation Project supervisor for a least two years (SVP 2010). The County shall review and approve the assessment before grading permits are issued. **Mitigation Measure GEO-2: Paleontological Resources Mitigation and Monitoring Program**	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	If the Project is determined to require a PRMMP, the Qualified Paleontologist shall prepare a PRMMP for submission to the County prior to the issuance of grading permits. The PRMMP shall include a pre-construction paleontological site assessment and develop procedures and protocol for paleontological monitoring and recordation. Monitoring shall be conducted by a qualified paleontological monitor who meets the minimum qualifications per standards set forth by the SVP. The PRMMP procedures and protocols for paleontological monitoring and recordation shall include: 1. Location and type of ground disturbance requiring paleontological monitoring. 2. Timing and duration of paleontological monitoring. 3. Procedures for work stoppage and fossil collection. 4. The type and extent of data that should be collected with recovered fossils. 5. Identify an appropriate curatorial institution. 6. Identify the minimum qualifications for qualified paleontologists and paleontological monitors. 7. Identify the conditions under which modifications to the monitoring schedule can be 8. implemented. 9. Details to be included in the final monitoring report. Prior to starting construction, copies of the PRMMP shall be submitted to the County for review and approval as to adequacy. **Mitigation Measure GEO-3: Paleontological Worker Environmental Awareness Program (WEAP)** Prior to any ground disturbance within the Project site, the applicant shall incorporate information on paleontological resources into the Project's WEAP materials, or a stand-alone Paleontological Resources WEAP shall be submitted to the	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	County for review and approval. The WEAP shall be given by a qualified paleontologist and shall include information on the appearance of fossils and procedures for notifying staff should fossils be discovered. The Paleontological WEAP training shall be fulfilled simultaneously with the overall WEAP training, or at the first preconstruction meeting. Printed literature shall accompany the initial training. Following the initial WEAP training, all new workers and contractors must be trained prior to ground disturbing work. A sign-in sheet for workers who have completed the training shall be submitted to the County upon completion of WEAP administration. **Mitigation Measure GEO-4: Paleontological Monitoring** Paleontological monitoring shall only be required for those ground-disturbing activities identified under Mitigation Measure GEO-1, where construction activities (i.e., grading, trenching, foundation work) are proposed in previously undisturbed (i.e., intact) sediments with high paleontological sensitivities. Monitoring shall be conducted by a qualified professional paleontologist or by a qualified paleontological monitor (as defined below) under the supervision of the qualified professional paleontologist. Monitoring may be discontinued on the recommendation of the qualified professional paleontologist if they determine that sediments are likely too young, or conditions are such that fossil preservation would have been unlikely, or that fossils present have little potential scientific value. The following outlines minimum monitor qualifications and procedures for fossil discovery and treatment: 1. Monitoring. Paleontological monitoring shall be conducted by a qualified paleontological monitor, who is defined as an individual who has experience with collection and salvage of paleontological resources and meets the minimum standards of the SVP (2010) for a	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Paleontological Resources Monitor. The Qualified Paleontologist will determine the duration and timing of the monitoring based on the location and extent of proposed ground disturbance. If the Qualified Paleontologist determines that full-time monitoring is no longer warranted, based on the specific geologic conditions at the surface or at depth, they may recommend that monitoring be reduced to periodic spot-checking or cease entirely. 2. Fossil Discoveries. In the event of a fossil discovery by the paleontological monitor or construction personnel, all work in the immediate vicinity of the find shall cease. A Qualified Paleontologist shall evaluate the find before restarting construction activity in the area. If the Qualified Paleontologist determines that the fossil(s) is (are) scientifically significant; including identifiable specimens of vertebrate fossils, uncommon invertebrate, plant, and trace fossils; the Qualified Paleontologist (or paleontological monitor) shall recover them following standard field procedures for collecting paleontological as outlined in the PRMMP prepared for the Project. 3. Salvage of Fossils. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case the Qualified Paleontologist shall have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner. If fossils are discovered, the Qualified Paleontologist (or paleontological monitor) shall recover them as specified in the Project's PRMMP.	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure GEO-5: Preparation and Curation of Recovered Fossils Once salvaged, significant fossils shall be identified to the lowest possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection (such as the University of California Museum of Paleontology), along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Qualified Paleontologist. **Mitigation Measure GEO-6: Final Paleontological Mitigation Report** Upon completion of ground disturbing activity (and curation of fossils if necessary) the Qualified Paleontologist shall prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where fossils were curated. The report shall be submitted to the County prior to occupancy permits. If the monitoring efforts produced fossils, then a copy of the report shall also be submitted to the designated museum repository.	
GREENHOUSE GAS EMISSIONS		
Impact GHG-1: The Project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment during construction or operation.	None required.	*Less-than-Significant*
Impact GHG-2: The Project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	None required.	*Less-than-Significant*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
HAZARDS AND HAZARDOUS MATERIALS		
Impact HAZ-1: The Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	None required.	*Less-than-Significant Impact*
Impact HAZ-2: The Project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials to the environment.	None required.	*Less-than-Significant Impact*
Impact HAZ-3: The Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	None required.	*No Impact*
Impact HAZ-4: The Project would not be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.	None required.	*No Impact*
Impact HAZ-5: The Project would not be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.	None required.	*No Impact*
Impact HAZ-6: The Project would potentially impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	See **Mitigation Measure TRAN-1**.	*Less-than-Significant*
Impact HAZ-7: The Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	None required.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	HYDROLOGY AND WATER QUALITY	
Impact HYDRO-1: The Project would potentially violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during construction.	**Mitigation Measure HYDRO-1: Water Quality Protection** The following measures shall be implemented to protect water quality during Project construction: • By October 15 following each construction season, the County shall require that all disturbed areas around the permanent and temporary bridge abutments be re-graded to match the surrounding topography. Seed and straw shall be placed on these and all other disturbed areas in the Project site. A jute mesh type or equivalent matting shall be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the County Permit and Resource Management Department (PRMD) and the DPI. • The Project site shall be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season following construction. During each visit, areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken. • Prior to any clearing, grubbing, pruning, or groundbreaking activity, the limits of construction shall be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas, protect all riparian vegetation beyond that which must be cleared for construction access, and prevent any equipment from unnecessarily extending the work area or entering the wetted channel. In addition, silt fencing shall be installed at the base of the construction fencing to prevent debris from entering the creek. All fencing shall be removed upon Project completion.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, refueling and maintenance, must occur outside the creek channel. No equipment will be washed where runoff could enter the creek. • All refueling and maintenance of equipment, other than stationary equipment, must occur outside the creek's top-of-bank. Receptacles containing fuel, oil, or any other substance that may adversely affect aquatic resources must be stored outside of the channel. Any hazardous chemical spills must be cleaned immediately. • To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material shall be placed underneath this equipment at all times to capture potential leaks. • The County will not allow any motorized equipment to be left within the creek channel (top of bank to top of bank) overnight, unless a container or similar method is securely placed beneath the equipment to catch any fluid leakage. All contained fluids will be disposed of in a permitted manner. • Prior to construction, the contractor will be required to prepare an Accidental Spill Prevention and Cleanup Plan. This plan must require spill control absorbent material, for use beneath stationary equipment, to be present on-site and available at all times. • The County shall require the contractor to use a drilling mud and slurry seal that is nontoxic to aquatic life for all drilling activities related to construction of Project. All drilling muds and fluid shall be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting must be collected and not be allowed to flow into the creek.	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• No equipment, including concrete trucks, will be washed within the channel of the creek, or where wash water could flow into the channel. Prior to Project construction, the contractor shall establish a concrete washout area for concrete trucks in a location where wash water will not enter the Maacama Creek. The washout area will follow the practices outlined in the San Francisco Bay RWQCB Erosion and Sediment Control Field Manual (page 107-108, July 1999) or equivalent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of PRMD and the DPI. • All drainage inlets within the Project site shall be protected from receiving polluted stormwater through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs. • All water that comes in contact with wet concrete must be pumped directly into tanks and disposed of at a permitted location. • Water encountered during construction of the bridge foundations shall be pumped upslope for disposal on nearby uplands in a way that would prevent it from flowing back into the creek or pumped directly into tanks and disposed of at a permitted location.	
Impact HYDRO-2: The Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.	None required.	*Less-than-Significant Impact*
Impact HYDRO-3a: The Project would potentially substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which	See **Mitigation Measure HYDRO-1**	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
would result in substantial erosion or siltation on- or off-site.		
Impact HYDRO-3b: The Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.	None required.	*Less-than-Significant Impact*
Impact HYDRO-3c: The Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.	None required.	*Less-than-Significant Impact*
Impact HYDRO-3d: The Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows.	None required.	*Less-than-Significant Impact*
Impact HYDRO-4: The Project would have a potentially significant impact associated with being located in flood hazard, tsunami, or seiche zones, risking release of pollutants due to Project inundation during construction.	See **Mitigation Measure HYDRO-1**	*Less-than-Significant Impact*
Impact HYDRO-5: The Project would potentially conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	See **Mitigation Measure HYDRO-1**	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
LAND USE AND PLANNING		
Impact LU-1: The Project would not physically divide an established community.	None required.	*Less-than-Significant Impact*
Impact LU-2: The Project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	None required.	*Less-than-Significant Impact*
MINERAL RESOURCES		
Impact MIN-1: The Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.	None required.	*No Impact*
Impact MIN-2: The Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.	None required.	*No Impact*
NOISE		
Impact NOISE-1: The Project would result in a potentially significant impact related to the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies, during construction.	**Mitigation Measure NOISE-1: General Construction Activities Noise Reduction Measures** The following measures shall be implemented throughout Project construction, in accordance with the County's' *Guidelines for the Preparation of Noise Analysis* document: • Limiting hours of construction to avoid the early morning and evening hours (such as 7:00 a.m. to 7:00 p.m. weekdays and 7:00 a.m. to 5:00 p.m. weekends). While the proposed Project construction hours would lie outside these recommended hours, approval from the County should be obtained prior to work commencing. • Limiting work to non-motorized equipment on Sundays and holidays.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• Using sound blankets for loud operations, such as pile driving, air compressors or other mechanical equipment, and consider pre-drilling holes prior to pile driving. • Siting construction staging areas as far as practical from nearby sensitive receptors. • Require street legal mufflers on all construction equipment. **Mitigation Measure NOISE-2: Construction Noise Control Plan** Prior to the beginning of Project construction, a construction noise control plan shall be developed by the Project construction contractor and submitted to the County for review and approval. The plan shall include, but is not limited to, the following construction best management controls: • Construct solid plywood fences along the construction site boundaries. Residences R1 and R2 are located in close proximity to Project boundary and constructing a temporary noise barrier fence to shield these receptors would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receptor and if the barrier is constructed in a manner that eliminates any cracks or gaps. For this Project, a minimum height of 8 feet for the temporary barrier should be used. • Except as provided herein, impact tools (e.g., jackhammers, pavement breakers, and rock drills) used for Project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures. • Stage large equipment, compressors, or generators at least 25 feet from the site perimeters located near residences R1 and R2 when work is not being done near these residences. • Construction activities should be conducted in a manner that minimizes the noise impact at the adjacent property boundaries wherever possible. Construction equipment shall be positioned as far from noise-sensitive receptors as possible. • Unnecessary idling of internal combustion engines should be strictly prohibited. • Prohibit noise from construction workers' stereos or other music devices. • Designate an on-site "disturbance coordinator," who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will maintain a complaint log, which shall include complaints received, the cause of the noise complaints (e.g., bad muffler, etc.), and how the noise complaint was addressed. Conspicuously post a large sign with information regarding the construction days/hours, complaint procedures, and telephone number for the disturbance coordinator and County Code Enforcement unit at the construction site. • The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.	

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact NOISE-2: The Project would not result in generation of excessive groundborne vibration or groundborne noise levels during construction or operation.	None required.	*Less-than-Significant Impact*
Impact NOISE-3: The Project is not located within the vicinity of a private airstrip or an airport land use plan, or within two miles of a public airport or public use airport which would expose people residing or working in the Project area to excessive noise levels.	None required.	*No Impact*
POPULATION AND HOUSING		
Impact POP-1: The Project would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).	None required.	*No Impact*
Impact POP-2: The Project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.	None required.	*No Impact*
PUBLIC SERVICES		
Impact PS-1a: The Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection.	None required.	*Less-than-Significant Impact*
Impact PS-1b: The Project would not result in substantial adverse physical impacts associated	None required.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
with the provision of new or physically altered governmental facilities or the need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police protection.		
Impact PS-1c: The Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for schools.	None required.	*No Impact*
Impact PS-1d: The Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for parks.	None required.	*No Impact*
Impact PS-1e: The Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for other public facilities.	None required.	*No Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
RECREATION		
The Project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	None required.	*No Impact*
The Project would not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.	None required.	*No Impact*
TRANSPORTATION		
Impact TRAN-1: The Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	None required.	Public Transit Facilities: *No Impact* Bicycle and Pedestrian Facilities: *Less-than-Significant Impact* Construction Traffic: *Less-than-Significant Impact*
Impact TRAN-2: The Project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	None required.	*Less-than-Significant Impact*
Impact TRAN-3: The Project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) during construction or operation.	None required.	*Less-than-Significant Impact*
Impact TRAN-4: The Project would result in a potentially significant impact associated with inadequate emergency access.	**Mitigation Measure TRAN-1: Emergency Access** Prior to commencement of construction, the construction contractor shall notify the following emergency service providers (i.e., fire departments, police departments, ambulance, and	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	paramedic services) of the construction schedule and potential for delays: • Sonoma County Fire District, (707) 838-1170 • Sonoma County Sherriff's Office, (707) 565-2121	
TRIBAL CULTURAL RESOURCES		
Impact TCR-1: The Project would potentially cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k). ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	See **Mitigation Measure CUL-1**	*Less-than-Significant Impact*
UTILITIES AND SERVICE SYSTEMS		
Impact UTIL-1: The Project would not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or	None required.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
relocation of which could cause significant environmental effects?		
Impact UTIL-2: The Project would have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years.	None required.	*Less-than-Significant Impact*
Impact UTIL-3: The Project would not result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments.	None required.	*No Impact*
Impact UTIL-4: The Project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.	None required.	*Less-than-Significant Impact*
Impact UTIL-5: The Project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	None required.	*Less-than-Significant Impact*
WILDFIRE		
Impact FIRE-1: The Project would potentially substantially impair an adopted emergency response plan or emergency evacuation plan.	See **Mitigation Measure TRAN-1**	*Less-than-Significant Impact*
Impact FIRE-2: The Project would not, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.	None required.	*Less-than-Significant Impact*

IMPACT	MITIGATION MEASURE	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact FIRE-3: The Project would not require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	None required.	*Less-than-Significant Impact*
Impact FIRE-4: The Project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	None required.	*Less-than-Significant Impact*

1.0 INTRODUCTION

The Sonoma County Department of Public Infrastructure (DPI) proposes to replace the existing Chalk Hill Road bridge over Maacama Creek (also known as the Maacama Creek Bridge). The existing Chalk Hill Road bridge is located in unincorporated Sonoma County east of Healdsburg, California. The DPI plans to use Federal Highway Bridge Program funds to replace the existing bridge to improve roadway safety and comply with the American Association of State Highway and Transportation Officials (AASHTO) design guidelines and Sonoma County Design Standards.

This section discusses the purpose of this EIR; the content and format of the EIR; the public review and participation process; the scope and content of the EIR; lead, responsible, and trustee agencies pursuant to the California Environmental Quality Act (CEQA); and the environmental review process required under CEQA. The proposed Chalk Hill Road Bridge Replacement Project (hereinafter referred to as the Project or proposed Project) is described in detail in *Section 2, Project Description.*

1.1 Purpose of EIR

Environmental review in compliance with CEQA (PRC §§ 21000, et seq., 14 CCR §§ 15000 et seq.) is required as part of the County's consideration of the Project. In order to develop the Project, the County must adopt at least one discretionary approval. The need for discretionary approvals is the trigger for CEQA applicability to a project. The proposed Project is receiving funding through the Federal Highway Bridge Program, which also necessitates adherence to applicable environmental review requirements of the National Environmental Policy Act (NEPA). For NEPA compliance, the California Department of Transportation (Caltrans), under assignment from the Federal Highway Administration, serves as the lead agency. The Sonoma County DPI acts as the lead agency for CEQA.

This Draft EIR has been prepared in compliance with the CEQA of 1970, as amended (California PRC § 21000 et seq.), and the State CEQA Guidelines (California Code of Regulations [CCR], Title 14, Chapter 3), to inform public decision makers and their constituents of the environmental impacts of the proposed Project. CEQA requires public agencies to evaluate the potential environmental impacts of projects under their review. This includes both direct impacts and impacts that are reasonably foreseeable but not directly caused by a project. When a discretionary project is expected to cause significant adverse effects on the environment, an EIR must be prepared before the project can be approved.

According to Section 15002 of the State CEQA Guidelines, the primary purposes of the CEQA are to:

- Inform government decision makers and the public about the potential significant environmental effects of proposed activities.
- Identify ways to avoid or substantially reduce environmental damage.
- Prevent significant and avoidable harm to the environment by requiring modifications to projects through alternatives or mitigation measures when such changes are found to be feasible.
- Explain to the public why a government agency approved a project when significant environmental effects are involved.

Before taking action on the Project, the County's Board of Supervisors will review the Draft EIR to understand the potential effects of implementing the Project. The Board will also consider additional information and public comments presented during their deliberations before making a final decision.

1.2 EIR Content and Format

This document discusses environmental impacts across several key issue areas. The analysis categorizes these impacts as either significant and unavoidable, significant but capable of being reduced to a less-than-significant level through mitigation, less than significant, or resulting in no impact or beneficial effects. Where possible, mitigation measures are recommended to reduce impacts caused by the Project.

The lead agency for a project is responsible for carrying out environmental review in accordance with the CEQA. When applicable, this includes incorporating mitigation measures outlined in this document or those developed specifically for the project in order to minimize environmental effects or reduce them to a less than significant level.

This EIR is organized in seven main sections:

1.0 Introduction. This section provides background information on the Project, describes the type of environmental document being used, and explains the content, structure, and public review process for the EIR.

2.0 Project Description. This section details the objectives of the Project, its location, and specific features and components.

3.0 Environmental Setting. This section describes the current physical conditions in the Project site and surrounding area.

4.0 Environmental Analysis. This section examines the existing conditions in the Project site and evaluates potential environmental impacts that could result from implementing the Project. Impacts are assessed using established thresholds of significance to determine their severity. Mitigation measures are recommended where feasible to reduce significant impacts. The analysis also identifies impacts that cannot be reduced to a less-than-significant level.

5.0 Other CEQA Considerations. This section covers growth related impacts that may arise from the Project, long term environmental effects, and significant irreversible changes to the environment.

6.0 Alternatives. This section presents alternative approaches to the proposed Project and compares their environmental impacts with those of the proposed Project.

7.0 Report Preparers and References. This section lists all sources consulted during the preparation of the EIR, including agencies, organizations, and individuals. It also identifies the individuals responsible for preparing the document.

1.3 EIR Review Process

1.3.1 Early Public Participation and Involvement

Early coordination and public involvement took place prior to starting the CEQA process. Community engagement was conducted through public workshops at the Alexander Valley Community Hall, located at 5512 CA-128 in Geyserville, California. Four meetings were held in February, June, and October 2019, and in July 2021 in order to solicit input from community members on the Project need and alternative bridge designs. These meetings allowed for the DPI to inform the community regarding the need for the Project, educate the public on the existing bridge condition based on Caltrans Inspection Reports, and describe Project constraints such as access to funding and feasibility of replacement versus retrofit/rehabilitation. Another meeting was held in September 2021, during which DPI displayed proposed concrete colors and textures for the replacement bridge. DPI also conducted a survey and solicited public comments regarding the visual character of the new bridge.

1.3.2 Notice of Preparation and EIR Scoping

CEQA Guidelines Section 15082 describes the purpose, content and process for preparing, circulating and facilitating early public and public agency input on the scope of an EIR. A Notice of Preparation (NOP) is a brief notice sent by the lead agency to notify the Responsible Agencies, Trustee Agencies, the Office of Land Use and Climate Innovation (formerly the Office of Planning and Research), and involved federal agencies that the lead agency plans to prepare an EIR for the Project. The NOP must also be filed with the County Clerk. The purpose of the NOP is to solicit guidance from those agencies as to the scope and content of the environmental information to be included in the EIR.

An NOP was prepared for the proposed Project and circulated for 32 days from April 4, 2025, to May 5, 2025, as required by CEQA. The NOP was sent to property owners of parcels adjacent to the Project site, as well as individuals and groups that had previously indicated an interest in the Project. The NOP is included as Appendix A. In addition, the County held a Scoping Meeting at 6:00 p.m. on April 16, 2025. The meeting was aimed at providing information on the CEQA review process for the proposed Project to members of public agencies, interested stakeholders, and community members, and to solicit input on the scope of the EIR. The County received one written response to the NOP during the public review period, which is summarized below in Table 1. No verbal comments were made on the scope of the EIR at the April 2025 Scoping Meeting. The NOP, as well as the Sonoma County Landmarks Commission response to the NOP are included in Appendix A.

Table 1. NOP Comments and EIR Response

COMMENTER	COMMENT/REQUEST	HOW AND WHERE IT IS ADDRESSED IN THE EIR
Sonoma County Landmarks Commission	The commenter states that the Chalk Hill Bridge is a Historic Landmark in Sonoma County (Landmark #171). The commenter requests that, once plans are drafted, a Historic Design Review application be submitted to Permit Sonoma in order to schedule the Project for review with the Landmarks Commission. The commenter includes the link to the Landmarks Commission's website which contains information on the application and review process.	See *Section 4.5, Cultural Resources* for details regarding the Landmarks Commission review process for the proposed Project.

1.3.3 Draft EIR

CONTENTS

This Draft EIR is an informational document which will inform the County's decision makers and the public generally of the significant environmental effects of the proposed Project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the Project. The County is required to consider the information in the EIR along with other information which may be presented to the agency. CEQA Guidelines Article 9 requires a draft EIR to contain the following information:

- Table of Contents;
- Summary;
- Project Description;
- Environmental Setting;
- Consideration and Discussion of Environmental Impacts;
- Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects;
- Consideration and Discussion of Alternatives to the Proposed Project;
- Effects not found to be Significant;
- Growth-Inducing Impacts;
- Unavoidable Impacts;
- Long-term Implications (Growth-Inducing Impacts, Significant Irreversible Environmental Effects, and Significant and Unavoidable Environmental Effects);
- Organization and Persons Consulted; and
- Discussion of Cumulative Impacts.

The details of this Draft EIR are outlined in the table of contents.

ENVIRONMENTAL ISSUES ANALYZED IN THE EIR

An NOP was prepared and circulated, and responses on the NOP were considered when setting the scope and content of the environmental information in this EIR. Sections 4.1 through 4.20 address the resource areas outlined in the bullets below. *Section 6.0, Other CEQA Considerations,*

covers topics including growth-inducing effects, irreversible environmental effects, and significant and unavoidable impacts. Environmental topic areas that are addressed in this EIR include:

1. Aesthetics
2. Agriculture and Forestry Resources
3. Air Quality
4. Biological Resources
5. Cultural Resources
6. Energy
7. Geology and Soils
8. Greenhouse Gas Emissions
9. Hazards and Hazardous Materials
10. Hydrology and Water Quality
11. Land Use and Planning
12. Mineral Resources
13. Noise
14. Population and Housing
15. Public Services
16. Recreation
17. Transportation
18. Tribal Cultural Resources
19. Utilities and Service Systems
20. Wildfire

In preparing the EIR, relevant County policies, certified EIRs, adopted CEQA documents, and other background materials were consulted. A complete list of references can be found in *Section 8.0, References*.

Section 7.0, Alternatives, of the Draft EIR was developed in accordance with CEQA Guidelines Section 15126.6. It focuses on alternatives that could reduce or avoid significant adverse environmental impacts while still achieving most of the Project's fundamental objectives. This section also identifies the "environmentally superior" alternative among those evaluated.

PUBLIC REVIEW

This Draft EIR will be circulated for a 45-day public review period. All comments addressing environmental issues received on the Draft EIR will be addressed in the Final EIR. CEQA Guidelines Section 15204(a) states that in reviewing a draft EIR, persons and public agencies should focus on the sufficiency of the document in identifying and analyzing the possible impacts of a project on the environment and ways in which the significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. At the same time, reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project. CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters.

CEQA Guidelines Section 15204(c) states that reviewers should explain the basis for their comments, and should submit data or references offering facts, reasonable assumptions based

on facts, or expert opinion supported by facts in support of the comments. Pursuant to Section 15064, an effect shall not be considered significant in the absence of substantial evidence.

1.3.4 Final EIR

CONTENTS

In accordance with CEQA Guidelines Section 15132, the Final EIR will provide the following:

- List of persons, organizations, and public agencies commenting on the draft EIR;
- Comments received on the draft EIR;
- Responses to significant environmental points raised in comments;
- Revisions that may be necessary to the draft EIR based upon the comments and responses; and
- A Mitigation Monitoring and Reporting Program.

According to CEQA Guidelines Section 15204(a), when responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good faith effort at full disclosure is made in the EIR. The Final EIR and the Draft EIR will together constitute the entire EIR.

1.3.5 Certification

CEQA Guidelines Section 15088 requires the lead agency to provide a written proposed response to a public agency on comments made by that public agency at least 10 days prior to certifying an EIR.

CEQA Guidelines Section 15090 requires lead agencies to certify the final EIR prior to approving a project. The lead agency shall certify that the Final EIR has been completed in compliance with CEQA, the Final EIR was presented to the decision-making body of the lead agency and that the decision-making body reviewed and considered the information contained in the Final EIR prior to approving the project, and that the Final EIR reflects the lead agency's independent judgment and analysis.

2.0 PROJECT DESCRIPTION

2.1 Project Overview

Chalk Hill Road is a rural north-south minor collector road in eastern Sonoma County. The road begins at Pleasant Avenue/Faught Road to the south and proceeds north 8.03 miles to its terminus at State Highway 128 in unincorporated Sonoma County. The existing one-lane bridge that carries Chalk Hill over Maacama Creek is a Sonoma County landmark that is eligible for inclusion on the National Register of Historic Places due to its age and unique character. However, the existing bridge is at risk of collapse from earthquakes and landslides and is scour critical. The purpose of the Chalk Hill Road Bridge Replacement Project (Project, proposed Project) is to ensure safe crossing for vehicles, bicyclists, and pedestrians over Maacama Creek by replacing the existing bridge.

2.2 Project Objectives

Section 15124(b) of the CEQA Guidelines requires that the project description of an EIR contain a statement of objectives for the proposed Project. The objectives of the proposed Project include the following:

1. Ensure safe crossing for vehicles, bicyclists, and pedestrians along Chalk Hill Road over Maacama Creek by replacing or rehabilitating the existing bridge.
2. Satisfy the requirements of California's Local Bridge Seismic Retrofit Program to protect the traveling public from earthquake related hazards.
3. Satisfy the requirements of the Federal Highway Administration's Highway Bridge Program and ensure the Project meets the civil, traffic, environmental, structural, and safety standards therein.
4. Reduce the potential for scour and erosion at bridge foundations to improve long-term structural stability and resilience during high-flow events

2.3 Project Site and Surroundings

2.3.1 Location and Setting

The Project site is located in the Alexander Valley region of northeastern Sonoma County, approximately 75 miles north of San Francisco. Figure 2-1 provides a map showing the Project's location. Alexander Valley is a subregion within the larger Russian River Valley, which stretches across much of central Sonoma County. Bordered by the Mayacamas Mountains to the east, the Russian River Valley itself is a relatively flat, wide expanse of land with gently rolling hills and fertile soils, creating an ideal environment for viticulture and agriculture. Its location along the Russian River provides natural irrigation and helps moderate the climate, while the surrounding mountains influence temperature variations. The western side of the valley experiences a cooler, fog-influenced climate due to the river's proximity and its connection to the Pacific Ocean, while the eastern side, including Alexander Valley, tends to be warmer and drier. Although the region is predominantly known for its flourishing wine industry, the rich soils and moderate climate also support other agricultural activities, including orchards and cattle ranching.

The 6.38-acre Project site is located along Chalk Hill Road approximately 1.25 miles south of State Route 128 within the eastern portion of Sonoma County. The Project site includes portions of Chalk Hill Road, Maacama Creek, and surrounding parcels. The Project site also includes an

existing one-lane bridge that carries Chalk Hill Road over Maacama Creek. The bridge is a historical landmark due to its age and unique character. The bridge is also recognized as a local landmark by the Sonoma County Landmarks Commission. The bridge corridor provides access from communities such as Windsor, Mark West Springs, Larkfield-Wikiup and Santa Rosa via U.S. Highway 101, and connects them to the rural, agricultural areas of Alexander Valley.

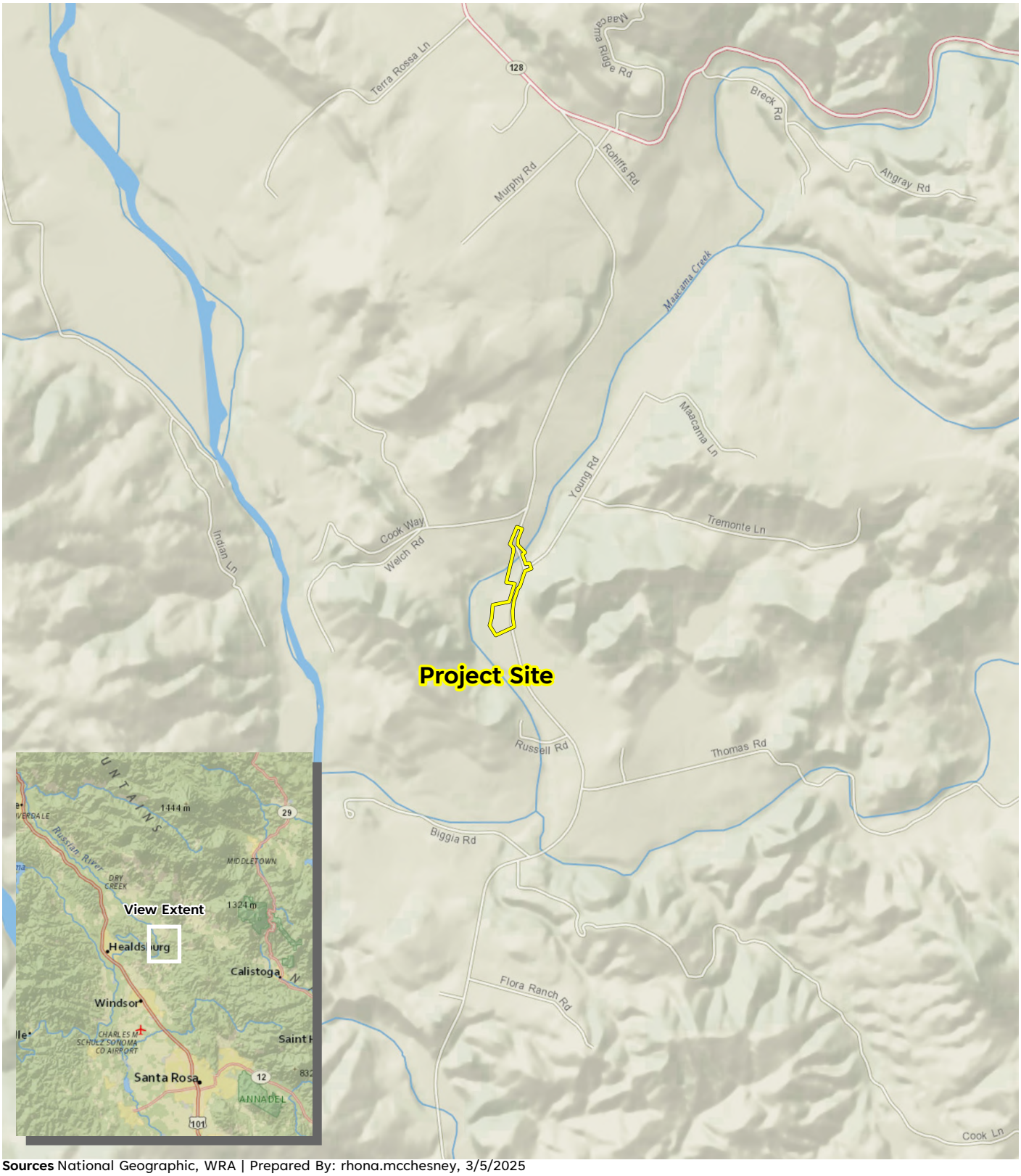
The majority of the proposed right-of-way for bridge replacement work is located within Assessor's Parcel Number (APN) 132-080-023, with small portions crossing into APNs 132-060-013, 132-080-022, 132-060-011 and 132-080-003. Construction staging areas occur in APNs 132-060-013, 132-080-022, and 132-080-017. Coordinates for the bridge crossing are at 38° 37' 19"North, 122° 46' 25"West. Figure 2-2 provides an aerial photograph of the Project site. The majority of the Project site comprises portions of Chalk Hill Road, a two-lane throughfare that begins east of Windsor and extends north until terminating at its junction with State Route 128. Areas of the Project site outside of Chalk Hill Road include portions of surrounding parcels, which consist of agricultural and residential lands, and Maacama Creek and surrounding riparian areas. Aside from the bridge, there are no other built structures on the Project site.

The Project site has a General Plan land use designation of Land Intensive Agriculture. The zoning designation is LIA (Land Intensive Agriculture) with a Scenic Resource (SR) combining zone along Chalk Hill Road, a Riparian Corridor (RC 100/50) and Oak Woodland (OAK) combining zone along Maacama Creek, and Historic District (HD) along the Chalk Hill Road bridge. APN 132-060-013 also has a Valley Oak Habitat (VOH) combining zone and an Accessory Dwelling Unit Exclusion (Z) combining zone. The LIA district aims to enhance and protect lands capable of and generally used for animal husbandry and the production of food, fiber, and plant materials. Permitted uses include agricultural production, agricultural support uses, agricultural employee housing, and other resource uses consistent with the General Plan Agricultural Resources Element.

2.3.2 Surrounding Uses

Parcels surrounding the Project site are within the Land Intensive Agriculture (LIA) General Plan designation and zoning district, the same as the Project site. The properties to the east and west are owned by private landowners and include rural residential and agricultural uses.

Areas to the east of Chalk Hill Road outside of APN 132-080-023 are within the planning area of the Franz Valley Area Plan, as shown on Figure 2-3. The Franz Valley Area Plan is a Sonoma County planning document created to guide land use, development, and conservation in the Franz Valley area, which is located in the northern part of the Russian River Valley near the town of Geyserville.



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name:Fig 1 Location CEQA

Sources National Geographic, WRA | Prepared By: rhona.mcchesney, 3/5/2025

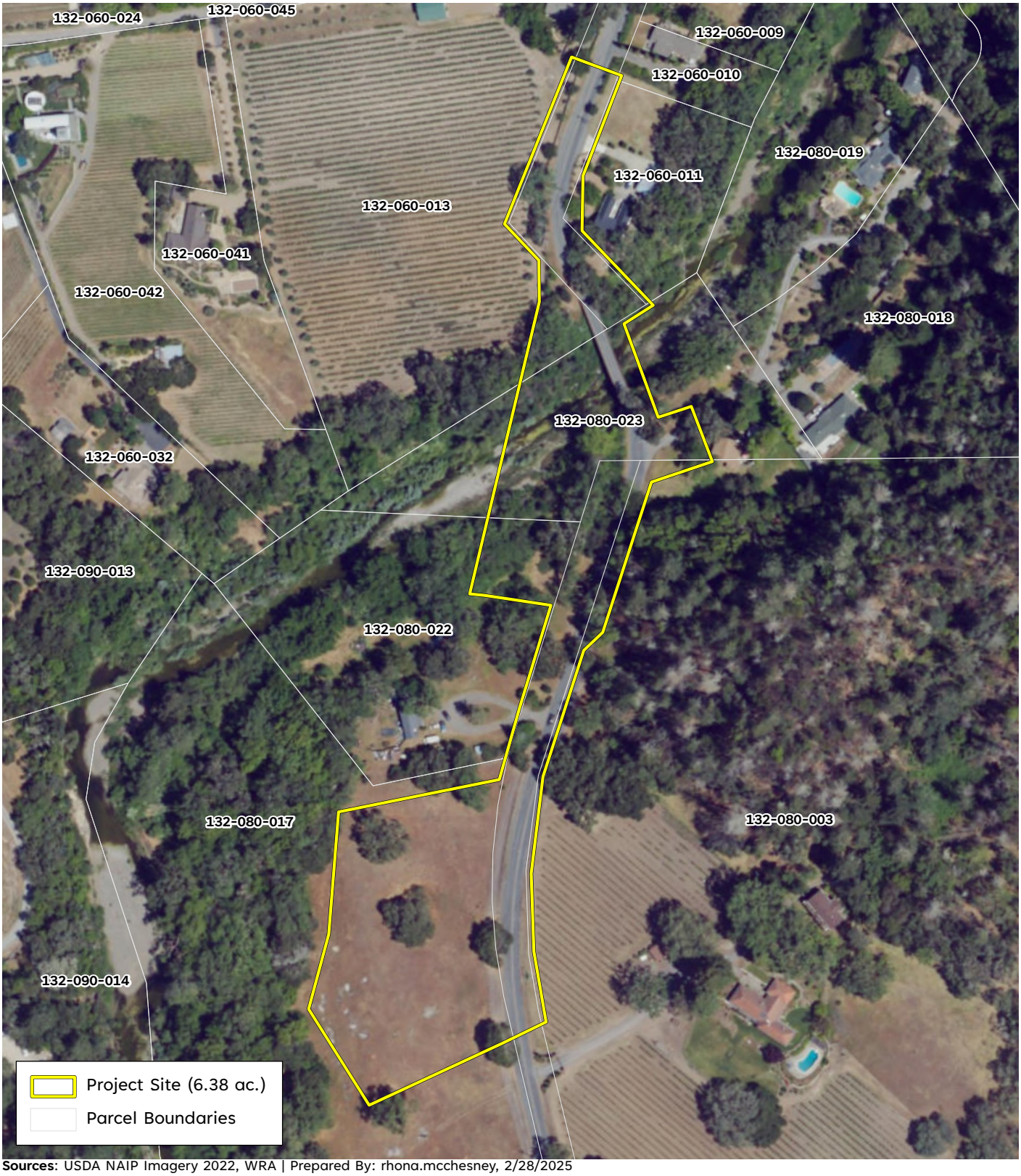
Figure 2-1. Project Site Regional Location

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 0.5 1 Miles

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wra Environmental Consultants



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Sources: USDA NAIP Imagery 2022, WRA | Prepared By: rhona.mcchesney, 2/28/2025

Figure 2-2. Aerial Photograph of the Project Site

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 250 500 Feet

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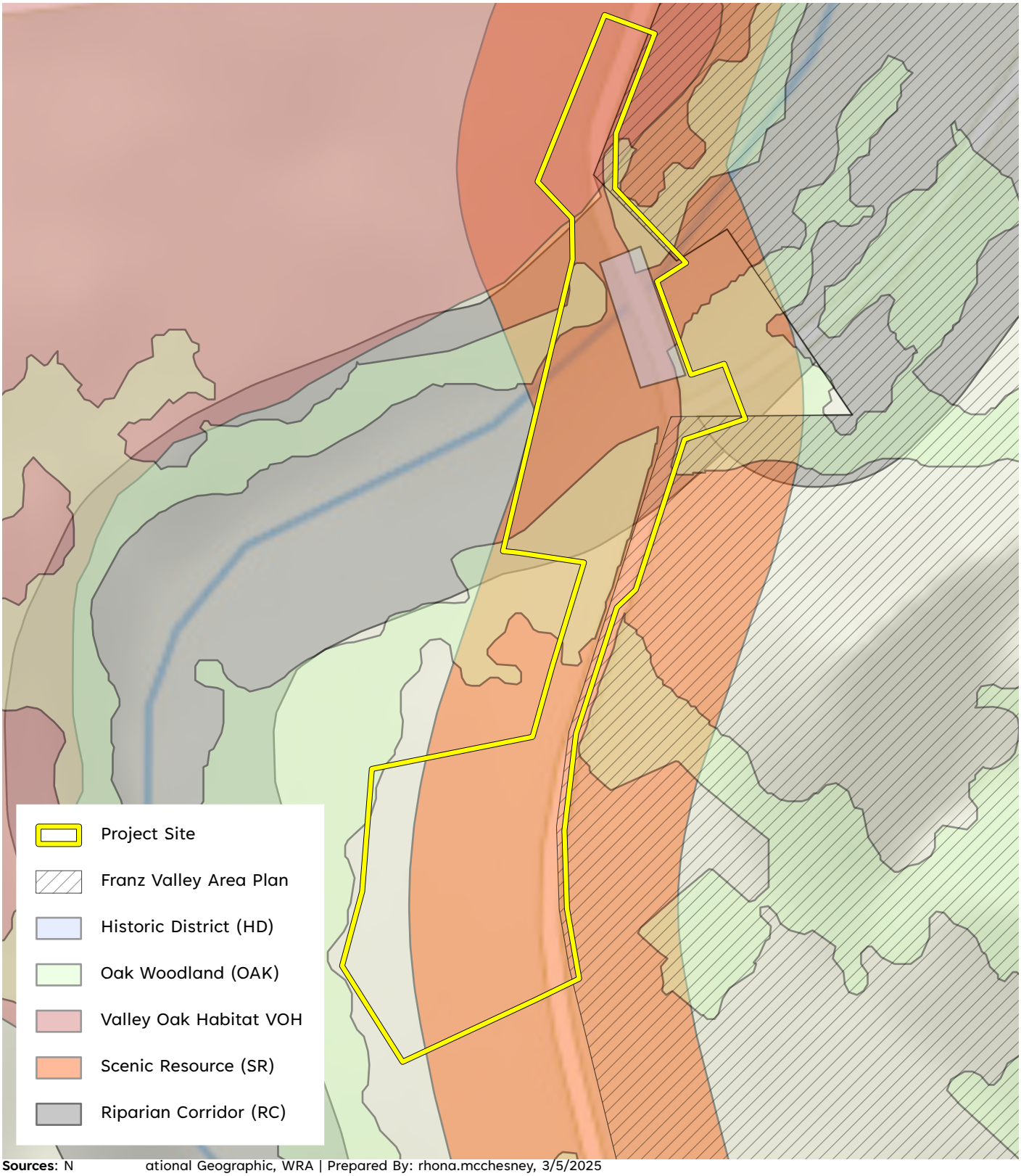


Figure 2-3. Zoning Overlays

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 250 500 Feet

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2.4 Project Background

The existing bridge along Chalk Hill Road over Maacama Creek was constructed in 1915. The main span is an open spandrel concrete arch on reinforced concrete thrust blocks. The approach spans are reinforced concrete T-beams on wall piers with unknown foundations. Both approaches have moderately tight radius curves. The existing guard rail is an open style aesthetic concrete baluster, and there are approach rails on all four corners. Portions of the existing guard rail were damaged and replaced in the past with rails of differing materials and appearance. Dimensions of the existing bridge are shown in Figure 2-4.

Based on the July 7, 2023, Caltrans Bridge Inspection Report, the existing bridge has a Sufficiency Rating of 51.8 out of 100 per the U.S. Department of Transportation Recording and Coding Guide for Structure Inventory and Appraisal of the Nation's Bridges (Caltrans 2023). The special (hydraulic) 2016 Caltrans Bridge Inspection Report designated the bridge as unstable and scour critical, meaning that the bridge's capacity has been negatively impacted and is highly vulnerable to "scour," or the erosion of sediment around the foundation of the structure by flowing water. Scour could potentially cause instability or failure of the bridge, especially during flood events. The bridge is not currently load limited and there are 15 mile-per-hour advisory postings as well as one-lane bridge signs at the north and south approaches to the bridge.

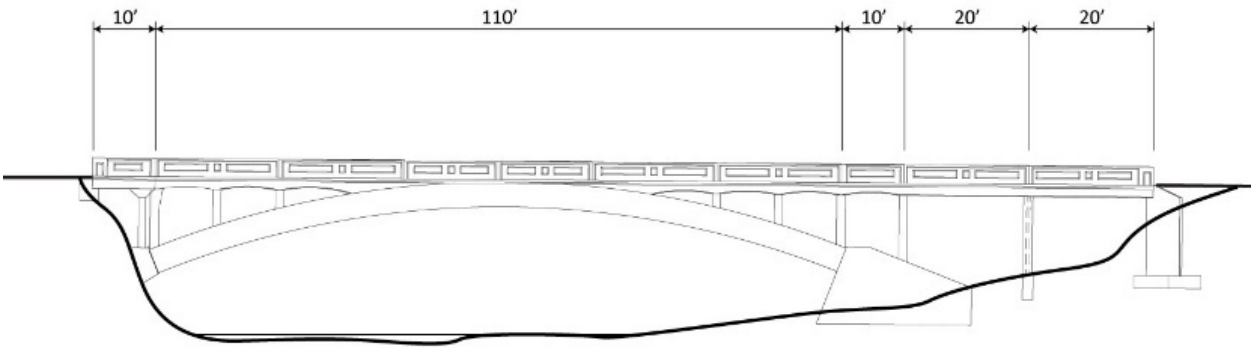


Figure 2-4. East Elevation of Existing Bridge

2.5 Project Characteristics

The proposed Project includes the construction of a new replacement bridge, followed by demolition of the existing bridge and the installation of scour countermeasures along the south creek bank.

2.5.1 New Replacement Bridge

The existing one-lane substandard bridge would be replaced with a two-lane bridge built to modern AASHTO standards. The replacement bridge would have two 11-foot lanes and two 4-foot shoulders for a total clear roadway width of 30 feet.

The proposed 30-foot total clear roadway width meets minimum AASHTO lane and shoulder width standards for an average daily traffic (ADT) count of 400 to 1,500 trips and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed use.

The replacement bridge would be a new two-lane crossing located downstream (west) of the existing bridge, crossing the creek with a single-span concrete box girder supported by reinforced concrete abutments. Retaining structures would be built along the west side of the bridge at the north approach roadway to minimize the take of farmland for new right-of-way, and at the south approach roadway to minimize the extent of embankment fill.

2.5.2 Existing Bridge Removal

The existing bridge would remain in service until the new bridge is operational. After switching traffic over to the new bridge, the existing bridge would be demolished and removed.

2.5.3 Scour Countermeasures

Scour countermeasures to stabilize the south creek bank and to protect the new replacement bridge would be installed. Such countermeasures include the installation of vegetated rock slope protection and large logs with root wads.

2.6 Project Construction

2.6.1 Construction Overview

The Project would be constructed in two construction seasons. The replacement bridge would be built and put into service during the first construction season. The existing bridge would remain open during the first construction season to maintain traffic. Once completed, traffic will be switched onto the new bridge.

Demolition of the existing bridge and implementation of scour countermeasures would occur during the second construction season.

Work below the top of the creek bank would be limited to the dry season per construction windows specified by applicable permits. The creek channel is expected to have minimal flow throughout the construction season, requiring only a minor diversion of the creek flow, as described in Section 2.6.2 below. Work on the new bridge approach roadways may occur at any time so long as water quality protections are implemented.

Unless otherwise specified in applicable permits or the contract specifications, construction hours would be limited to 7 a.m. to 7 p.m. on weekdays, and 9 a.m. to 7 p.m. on weekends and holidays.

2.6.2 Access, Staging, and Equipment

The following equipment would be required for Project construction:

- Diesel-powered air compressors
- Diesel-powered electrical generators
- Wheel-mounted reach forklifts
- Wheel-mounted or track-mounted cranes
- Wheel-mounted concrete pumps
- Wheel-mounted motor graders
- Track-mounted pile rigs
- Track-mounted excavators
- Wheel-mounted or track-mounted drilling rigs
- Track-mounted bull dozers
- Utility compactor/roller
- Concrete and asphalt paving machines

- Wheel-mounted frontend loaders
- Pickup trucks and dump trucks

Potential equipment staging areas are shown below on Figure 2-5. Use of the potential staging areas would require temporary construction easements that would be negotiated between the construction contractor and the private property owners.

Some equipment may also be staged on the creek bed within County right-of-way on APN 132-080-023. Construction equipment staged on the creek bed is anticipated to include track-mounted drilling rigs, wheel-mounted reach forklifts, and track-mounted excavators. Materials temporarily placed in the creek bed are anticipated to include clean gravel, straw waddles, K-rail to form a 4-foot-wide channel for a temporary stream diversion and fish channel, and timber falsework to support concrete forms. Falsework refers to temporary, supporting structures used to hold up a bridge during construction until the permanent structure can support itself. The equipment, straw waddles, K-rail, and timber falsework would be removed before the end of the dry season.

The staging areas identified include an area roughly 125 feet by 75 feet on APN 132-080-022 located southwest of the existing bridge, an area roughly 250 feet by 400 feet on APN 132-080-017 located farther south, and an approximately 30 feet by 150 feet area on APN 132-060-013 located northwest of the existing bridge. These staging areas may be used year-round so long as erosion control and creek protections remain in place.

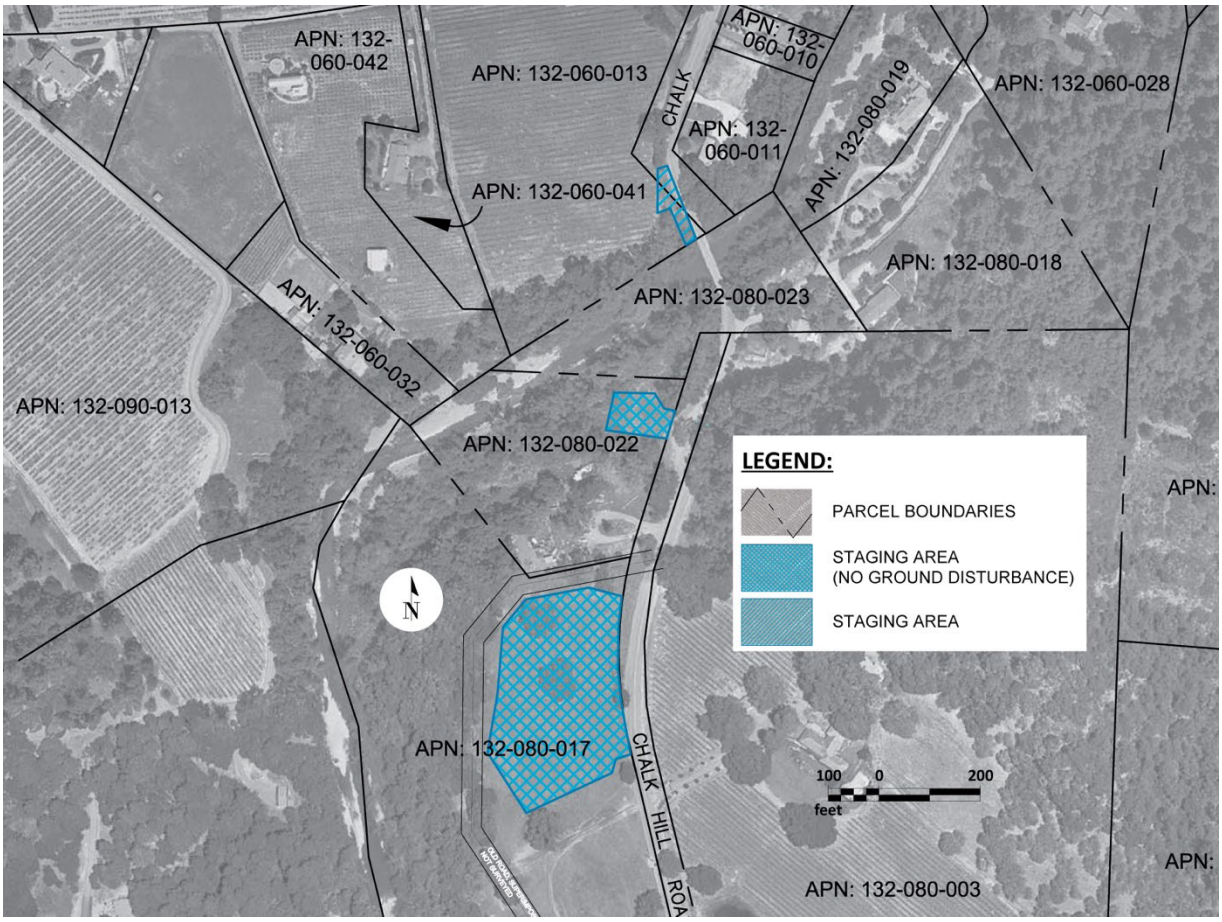


Figure 2-5. Potential Equipment Staging Areas

2.6.3 Site Work

Work on the Project site would be conducted in two construction seasons. The first season would consist of construction site preparation, constructing the new bridge, installing retaining walls, configuring the approach roadways to the new bridge, and reconfiguring the Young Road and Chalk Hill Road intersection. The second season would consist of demolishing the existing bridge and revegetating excavated areas with native vegetation. Details on each element of construction are provided in the following sections.

Based on the preliminary 35 percent design plans, work on the Project site would require approximately 2,656 cubic yards of fill (import) material. Construction of the Project would result in an approximate increase of 7,195 square feet of impervious surface area.

Access to the creek bed must be provided in order to create a stream diversion/fish channel, to construct temporary falsework to build the replacement bridge, to install slope stability tiebacks, to implement south creek bank stabilization, and to demolish the existing bridge. Once the dry season starts, the contractor would access the creek bed from three locations downstream of the existing bridge, including:

- Down the north bank between the existing bridge and the vineyard on APN 132-060-013,

- Down the south bank west of and adjacent to the existing bridge on APN 132-080-023, and
- Down the south bank about 170 feet west of the existing bridge on APN 132-080-023

Stream protections, including stormwater pollution prevention techniques, would be implemented at all access points.

SITE PREPARATION

1. Prior to construction of the new bridge, the overhead PG&E and AT&T utilities would be permanently relocated.
2. To create room for the new abutments, excavation supports would be installed on the west side of both existing abutments. The excavation supports would be designed by the construction contractor and would likely be soil nail walls.
3. Stream protections, such as silt fences and straw wattles, would be placed around the abutment sites to prevent excavated material from polluting Maacama Creek before excavation begins.

CREEK ACCESS AND STREAM DIVERSION

1. Once access to the channel bottom is arranged, a stream diversion system with minimal channel grading would be implemented. Construction of the stream diversion system and bridge falsework would begin at the start of the dry season as specified in the applicable permits. The stream diversion system would extend up to 200 feet downstream from a location originating approximately 50 feet upstream of the existing bridge. Clean 1.5-inch drain rock up to 2 feet deep would be placed over the creek bed below the construction area, then levelled as needed to provide a work area or falsework support. Minor vegetation removal within the creek channel may be required. Some equipment may need to cross the creek bed downstream of the diversion system, at the three locations described above. Work would then begin on the abutments beyond the creek channel.

CONSTRUCTION OF THE NEW BRIDGE

Construction work within the wetted channel would be limited to work necessary to construct falsework and to remove the existing bridge. Steps for construction of the new bridge would occur as follows:

1. Track-mounted excavators would be positioned below the top-of-bank of Maacama Creek and would be used to dig to the bottom of the north and south bridge abutments. Excavated materials would be stored within the new approach right of ways and eventually be incorporated into the embankment fill for the approach roadways. Once the excavation is complete, cast-in-drilled-hole (CIDH) piles would be placed, and the pile caps, abutments, and wingwall forms would be constructed.
2. Falsework supported on the channel bottom would be installed to construct the new bridge. Level work pads would be created with clean 1.5-inch drain rock to support falsework on the channel bottom. Falsework would consist of steel and timber beams supported on braced timber bents bearing on the clean gravel work pads.
3. After the abutments are cast and cured and the falsework is in place, work on the superstructure would begin. After the superstructure is cast, cured and pre-stressed, all

falsework in the creek channel would be removed by the end of the construction window as specified in the applicable permits.

4. Following completion of work within the channel, the stream diversion system and any debris from construction would be removed. The channel bottom would be regraded to restore the site to its original contours. The 1.5-inch drain rock would remain in place permanently.
5. Large boulders would be placed along the toe of the south creek bank as a temporary scour countermeasure to protect the new and existing bridge during the upcoming rainy season.

Best Management Practices (BMPs) for stream protection would be implemented at the creek bed access points and new roadway approaches to winterize the construction site. BMPs would include placing jute mesh on exposed ground surfaces and the placement of straw wattles to prevent sediment from entering the creek or drainage inlets.

APPROACH ROADWAYS, RETAINING WALLS, AND BRIDGE RAILS

Retaining walls made of concrete with spread footings for support would be constructed along the west side of the approaches.

Once the retaining walls and abutments are constructed, the approach roadways would be filled and compacted.

Complete road closures may be required to tie the new approach roadways to the existing roadways. These closures would be limited to ten minutes for emergency vehicles and 30 minutes for other vehicles. Once the retaining walls and new approach roadways are constructed, the concrete bridge barrier rails would be erected.

YOUNG ROAD INTERSECTION

The existing intersection of Chalk Hill Road with Young Road must be rebuilt to conform to the slightly raised south approach grades and the new bridge location. The intersection must be built in stages to maintain traffic on Chalk Hill Road and to maintain access to homes on Young Road.

Once the new intersection roadway surface is complete, the intersection would be signed and striped as needed to provide a safe pedestrian and bicycle crossing of Young Road. Once the new bridge is complete and pavement striped, traffic would be switched onto the new roadway and the site would be winterized to prevent erosion and sediments from entering the creek.

REMOVAL OF EXISTING BRIDGE AND INSTALLATION OF PERMANENT SCOUR COUNTERMEASURES

Demolition of the existing bridge and installation of permanent scour countermeasures would occur during the construction season that follows construction of the replacement bridge. Steps for demolition of the existing bridge and installation of permanent scour countermeasures would occur as follows:

1. The stream diversion system and channel bottom protections described above would be re-implemented during the second construction season. The same access to the channel bottom used for construction of the replacement bridge would be used for demolition of

the existing bridge.

2. The existing bridge would be demolished and removed from the site to a legal disposal facility.
3. The top triangular half of the large tuff block that supports the south end of the existing bridge would be removed and the remainder secured with soil nails.
4. Permanent scour countermeasures would be installed to stabilize the south creek bank to protect the new replacement bridge. Scour countermeasures would consist of vegetated rock slope protection (RSP) and large logs with root wads secured with tie-downs. Scour countermeasures would extend from the south abutment of the existing bridge to a point approximately 100 feet downstream along the south creek bank.
5. Following completion of work within the channel, the stream diversion system and any debris from construction would be removed by the end of the construction window specified in the applicable permits. The channel bottom would be regraded to restore the site to its original contours. The 1.5-inch drain rock may remain and need not be removed.
6. Access to the channel bottom would be regraded to match the surrounding topography and replanted. The appropriate erosion control BMPs would be implemented to winterize the construction site.

LANDSCAPING AND REVEGETATION

The asphalt paving from the abandoned approach roadways would be removed and the soil below ripped to a minimum depth of 2 feet. Jute mesh would be placed and seed cast per Project plans. Native trees and bushes would be planted on the south approach embankment fill, along the north approach retaining wall and at the abandoned approach roadways. A stormwater pollution prevention plan (SWPPP) that includes silt fences and straw wattles would be implemented to winterize the site.

2.7 Permit and Approval Requirements

This EIR is intended to provide the information and environmental analysis necessary to assist public agency decision makers in considering all approvals necessary for the planning, development, construction, operation, and maintenance of the proposed Project.

As the Lead Agency for the Project under CEQA, the County of Sonoma is responsible for reviewing and certifying the adequacy of this EIR. The County will use the EIR in its decision-making for considering whether to approve the proposed Project. Other approvals that would be required for the Project include the following:

2.7.1 County of Sonoma

- Project approval by the Sonoma County Board of Supervisors
- Project approval by Sonoma County Landmarks Commission

2.7.2 State Water Resources Control Board

- Notice of Intent for coverage under the statewide Construction General Permit, including preparation of a Stormwater Pollution Prevention Plan (SWPPP)

2.7.3 California Department of Fish and Wildlife

- Lake and Streambed Alteration (LSA) Agreement
- Incidental Take Permit

2.7.4 North Coast Regional Water Quality Control Board

- Clean Water Act Section 401 Water Quality Certification

2.7.5 National Marine Fisheries Service

- Endangered Species Act Section 7 Biological Opinion

2.7.6 United States Army Corps of Engineers

- Clean Water Act Section 404 Permit

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3.0 ENVIRONMENTAL SETTING

This section offers a broad summary of the environmental context surrounding the proposed Project. For in-depth discussions of the environmental setting specific to each issue area, please refer to the individual environmental issue discussions in *Section 4, Environmental Analysis*.

3.1 Regional Setting

The Project site is located in unincorporated Sonoma County, east of Healdsburg and approximately 75 miles north of San Francisco. Figure 2-1 in *Section 2, Project Description*, provides an overview of the regional location of the Project site. The Project site is regionally accessible from Chalk Hill Road via U.S. Highway 101 and State Route 128.

The Project site is in a rural area in eastern Sonoma County within the Alexander Valley region, which is a subregion of the Russian River Valley. The regional setting is generally composed of vineyards, oak woodlands, single family residences, agricultural lands, and open space. The Mediterranean climate of the region and the coastal influence produce moderate temperatures year-round, with rainfall concentrated in the winter months.

3.2 Project Site and Existing Uses

As shown in Figure 2-2 in *Section 2, Project Description*, the Project site is located in a rural area of the County. The Project site includes portions of Chalk Hill Road, Young Road, Maacama Creek, the Chalk Hill Road Bridge, and surrounding privately owned parcels. Chalk Hill Road is a two-lane road that allows travelers from urban centers such as Windsor, Mark West Springs, Larkfield-Wikiup, and Santa Rosa to travel east from U.S. Highway 101 to easily access the scenic, vineyard-rich countryside of Alexander Valley. The existing bridge that carries Chalk Hill Road over Maacama Creek is known as the Maacama Creek Bridge, and it is a historic landmark of Sonoma County. The one-lane bridge was built in 1915 and is a poured-in-place open-spandrel reinforced concrete bridge. The bridge features decorate concrete railings, major sections of which have been replaced with metal beam railing. The bridge's location marks a scenic transition point along Chalk Hill Road, where the rural roadway narrows to a single lane and passes over the creek via the historic arch, surrounded by native riparian vegetation and oak woodlands. The bridge and road corridor are vital for local transportation, connecting rural agricultural lands with surrounding communities and facilitating the movement of goods, services, and people, as well as emergency services across Maacama Creek.

Maacama Creek flows from the Mayacamas Mountains to the east and meets the Russian River approximately one mile southwest of the Project site. The creek is surrounded by a mix of native and non-native species, including vegetative communities such as mixed oak woodland, California bay riparian woodland, valley oak woodland, purple needlegrass grassland, wild oats grassland, Himalayan blackberry, coyote brush scrub, coast live oak woodland, and Arroyo willow thicket. Maacama Creek is typically a perennial creek, though flows vary with rainfall patterns of a given season and year.

The environmental setting as it relates to individual impact analysis sections are provided within each impact area described in *Section 4, Environmental Analysis*. Each of these sections describes the baseline physical conditions of the site as established on April 4, 2025, when the

County published the NOP. Physical conditions that may have changed after this day may be included for informational purposes only.

3.2.1 Project Site Access

Local access to the Project site is provided via Chalk Hill Road, which runs north-south through eastern Sonoma County from State Highway 128 to the north to Faught Road to the south. Regional access to the site is provided via U.S. Highway 101 from the west and State Route 128 from the east. There are no bike paths or public transit stops within the Project site.

3.2.2 Project Site Existing Uses

Beyond Chalk Hill Road, the Project site extends into adjacent properties that are primarily used for agriculture and rural residences, as well as encompassing Maacama Creek and its bordering riparian habitat. With the exception of the bridge, the site contains no other constructed features or buildings.

The existing land use designations of surrounding parcels include Land Intensive Agriculture (LIA), as well as Scenic Resource (SR), Riparian Corridor (RC 100/50), Oak Woodland (OAK), Historic District (HD), Valley Oak Habitat (VOH), and Accessory Dwelling Unit Exclusion (Z) combining zones. The immediate area is rural, with no nearby schools, railways, or airports, and is characterized by its quiet, agricultural setting and proximity to waterways such as Maacama Creek and the Russian River.

Photographs of the Project site under existing conditions are presented in Figure 3-1.

3.3 Existing/Baseline Conditions

CEQA Guidelines Section 15125 states that an EIR "must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation [NOP] is published." Section 15125 states that this approach "normally constitute[s] the baseline physical conditions by which a lead agency determines whether an impact is significant."

This EIR evaluates Project impacts against existing conditions, which are generally conditions existing at the time of the release of the NOP (March 2025). A comparison to current, existing baseline conditions provides the most relevant information for the public, responsible agencies and County decision-makers.



View from the existing bridge facing east. July 2025.



View from the existing bridge facing west. July 2025.



View of the roadway over the existing bridge facing north. April 2025.



View of the western side of the existing bridge facing north. July 2025.



View of the western side of the existing bridge facing north. June 2026.

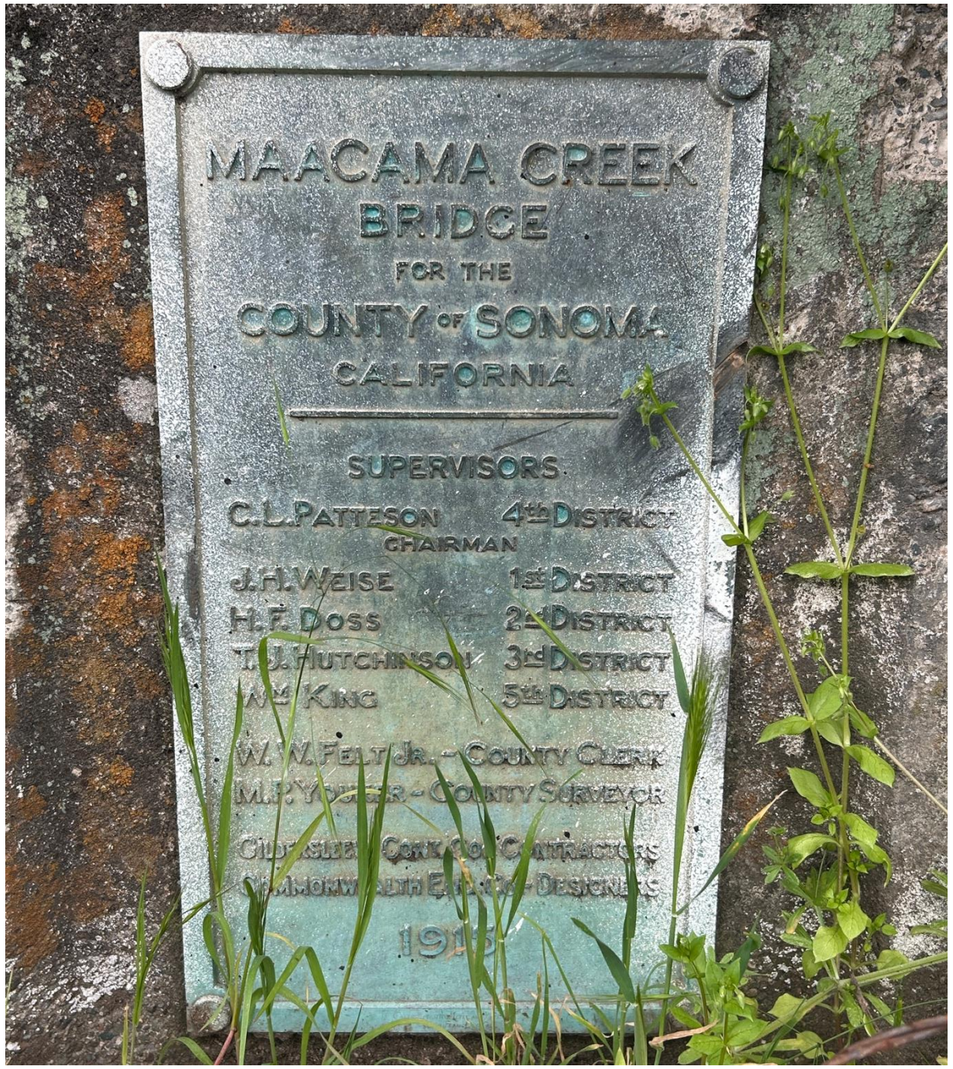


View of the western side of the existing bridge facing southeast. July 2025

Figure 3-1. Project Site Existing Conditions

Chalk Hill Road Bridge Replacement
Sonoma County, California

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Historic Bridge Plaque.



View underneath the existing bridge facing northeast. July 2025.

Figure 3-1. Project Site Existing Conditions

Chalk Hill Road Bridge Replacement
Sonoma County, California

wra Environmental Consultants

4.0 IMPACT ANALYSIS

This section discusses the possible environmental effects of the proposed Project for the issue areas identified in Appendix G of the CEQA Guidelines, contained in Title 14, Division 6, Chapter 3 of the California Code of Regulations. A "significant effect" is defined by the CEQA Guidelines Section 15382 as:

> A substantial, or potentially substantial, adverse change in any of the physical conditions within an area affected by the project, including land, air, water, minerals flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

Each environmental issue area begins with a description of the existing environmental and regulatory setting, followed by an analysis of the potential effects of the proposed Project. The impact analysis first identifies the analytical methods and applicable significance criteria used to evaluate potential environmental effects. These criteria may be based on thresholds established by the County or other agencies, generally accepted standards, applicable regulatory requirements, or criteria developed specifically for the Project.

Potential impacts are then evaluated individually. Each impact identifies the nature and extent of the potential environmental effect, followed by any applicable mitigation measures and the resulting level of significance after mitigation. Individual impacts are identified using bolded impact statements, with each statement accompanied by a significance determination.

The following significance categories are used in this EIR:

- **Significant and Unavoidable.** The project would result in a significant environmental impact that cannot be reduced to a less-than-significant level through the implementation of feasible mitigation measures. If the project is approved despite such an impact, the lead agency would be required to adopt a Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093.
- **Less than Significant with Mitigation Incorporated.** The project would result in a potentially significant environmental impact that can be reduced to a less-than-significant level through implementation of feasible mitigation measures.
- **Less than Significant.** The project would result in an adverse environmental effect that would not exceed the applicable significance criteria. No mitigation would be required; however, measures that could further reduce an environmental effect may be identified where appropriate.
- **No Impact.** The project would not result in an impact to the environmental resource or condition being evaluated.

Where mitigation is required, the impact discussion identifies the applicable mitigation measures and the resulting residual level of significance following implementation. Where implementation of a mitigation measure could itself result in a potentially significant environmental effect in another resource area, that secondary effect is evaluated within the applicable issue area.

Where appropriate, each environmental issue area also includes an analysis of cumulative impacts. The cumulative analysis evaluates the project's incremental effects in combination with the effects of other past, present, and reasonably foreseeable future projects and activities in the study area. Cumulative impacts are evaluated where the project would contribute to a potentially significant cumulative effect. Where the Project would have no impact on a particular resource, a cumulative impact analysis is generally not warranted.

The EIR's Executive Summary provides a consolidated summary of the Project's identified environmental impacts, applicable mitigation measures, and resulting levels of significance.

4.1 Aesthetics and Visual Resources

This section describes the existing visual setting of the Project site and vicinity, identifies associated regulatory requirements, evaluates potential impacts, including cumulative impacts, and identifies mitigation measures related to implementation of the proposed Project.

4.1.1 Setting

The location and surrounding context of the Project site play a key role in assessing the nature and extent of potential changes to the existing visual environment. To support this assessment, the terms 'visual character' and 'visual quality' are defined below and help further describe the area's visual attributes. The term 'project setting' encompasses the land that is visible from, adjacent to, or beyond the Chalk Hill Road right-of-way, and is determined by topography, vegetation, and viewing distance.

The 6.38-acre Project site is located along Chalk Hill Road in eastern Sonoma County, approximately 1.25 miles south of State Route 128. The Project site is situated in a rural setting and contains portions of Chalk Hill Road, the Maacama Creek riparian corridor, and surrounding agricultural land. The Project site also contains a bridge over Chalk Hill Road, which was constructed in 1915. The landscape is characterized by the valley oak woodland, agricultural land, and Maacama Creek and associated riparian vegetation. According to the Sonoma County Land Use Map, the Project site is designated as Land Intensive Agriculture (LIA). The zoning designation for the site is LIA with a Scenic Resource (SR) combining zone along Chalk Hill Road, a Riparian Corridor (RC 100/50) and Oak Woodland (OAK) combining zone along Maacama Creek, and Historic District (HD) along the Chalk Hill Road bridge. APN 132-060-013 also has a Valley Oak Habitat (VOH) combining zone and an Accessory Dwelling Unit Exclusion (Z) combining zone. Due to local topography and vegetation, the Project site is primarily visible from Chalk Hill Road and surrounding private properties.

SCENIC ZONING

Scenic Resources Combining District

The Sonoma County General Plan designates three categories of scenic resources: Community Separators, Scenic Landscape Units, and Scenic Highway Corridors. These scenic resource areas are designated by the Scenic Resource (SR) combining zoning district, which aims to preserve the visual character and scenic resources of lands in the County and to implement the provisions of the General Plan Open Space and Resource Conservation (OSRC) Element. Chalk Hill Road is designated as a Scenic Corridor by the General Plan; therefore, the SR combining district applies to the roadway corridor.

Valley Oak Habitat Combining District

The valley oak habitat (VOH) combining district aims to protect and enhance valley oaks and valley oak woodlands and to implement the provisions of the General Plan OSRC Element. Portions of the Project site on APN 132-060-013 and 132-060-011 are within the VOH combining district.

While the importance of valley oak woodlands to the surrounding habitat and biological resources in the County is discussed in *Section 4.4, Biological Resources*, trees and woodlands are also an important part of the County's visual landscape and are an important visual resource. They also help soften the changes brought by urbanization and infill in areas that previously had

a more rural character. Accordingly, VOH-zoned sites in the Project area are further discussed in the impact analysis section, specifically regarding how tree removal could affect the site's visual quality.

VIEWPOINTS

Due to the local topography and vegetation, as well as the makeup of private properties surrounding the site, the bridge is only seen from a few public viewpoints. To assist the visual impact analysis of the proposed Project, photos of the current bridge taken from various viewpoints were compared to visual simulations of the Project taken from the same viewpoint. These public viewpoints are (1) looking east towards the bridge (upstream up Maacama Creek), (2) looking north from the southern bridge approach, and (3) looking south from the northern bridge approach. Figures 4.1-1 to 4.1-3 depict the before and after photo illustrations of the Project area from the three public viewpoints.



Looking East (Upstream) - Before



Looking East (Upstream) - After

Figure 4.1-1. Looking East (Upstream) - Before and After

Chalk Hill Road Bridge Replacement
Sonoma County, California

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Looking North from South Approach - Before



Looking North from South Approach - After

Figure 4.1-2. Looking North from South Approach - Before and After

Chalk Hill Road Bridge Replacement
Sonoma County, California

wra Environmental Consultants



Looking South from North Approach - Before



Looking South from North Approach – After

Figure 4.1-3. Looking South from North Approach - Before and After

Chalk Hill Road Bridge Replacement
Sonoma County, California

wra Environmental Consultants

LIGHT AND GLARE

For the purposes of this analysis, "light" refers to visible light emissions (brightness) produced by various sources. Stationary sources include lighting for parking lots and security purposes, while moving sources refer primarily to vehicle headlights on roads near the Project site. In the evening, streetlights and other forms of security lighting also contribute to overall illumination. Bright, highly visible lights at night can interfere with views of the night sky and may be noticeable from great distances when not obstructed by terrain or vegetation. Vehicle lights, in particular, tend to draw attention due to their movement and are difficult to overlook.

Light pollution is a negative effect of artificial lighting and includes urban sky glow, glare, and light trespass. This type of excessive lighting can dramatically alter the character of rural or natural environments by emphasizing built features at night and contributing to visual clutter (International Dark Sky Association 2025).

In less developed rural areas, current lighting conditions are minimal and consist mainly of occasional vehicle headlights, sparse street lighting, and limited structural lighting (both interior light visible through windows and external lights for safety or security). There is little light spillage from developed areas into surrounding uses, and nighttime views of the sky are generally unobstructed. In contrast, more urbanized areas exhibit lighting typical of suburban and urban development, with a higher presence of streetlights and exterior security lighting. In developed rural residential areas, lighting is more pronounced than in remote rural zones but remains less intense than in areas bordering larger cities such as Santa Rosa or Sonoma.
Glare is defined as the presence of intensely focused light, either directly from a source or indirectly from reflective surfaces. Daytime glare is often caused by sunlight reflecting off smooth or shiny surfaces that are at or above eye level. These reflective surfaces may include buildings with glass or polished finishes, light-colored pavement, or the windshields of parked cars. Within the county, several factors help minimize glare, including tree cover, the limited number of large parking areas, and General Plan design policies. These policies guide the visual character of new development, often requiring that parking areas be screened or positioned out of view as part of enhanced streetscaping efforts (County of Sonoma 2024).

4.1.2 Regulatory Setting

STATE REGULATIONS

State Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 for the purpose of protecting and enhancing the natural scenic beauty of California highways and adjacent corridors. The California Department of Transportation (Caltrans) is responsible for designating scenic highways and adopting a Corridor Protection Program for officially designated highways. Suitability for designation as a state scenic highway is based on vividness, intactness, and unity (Caltrans 2008).

1. Vividness describes the extent to which the landscape is memorable. This quality is associated with the distinctiveness, diversity, and contrast of visual elements. A vivid landscape makes an immediate and lasting impression on the viewer.
2. Intactness describes the integrity of visual order of the landscape and the extent to which the natural landscape is exempt form visual intrusions, such as buildings, structures, equipment, or grading.

3. Unity describes the extent to which local development is sensitive to and visually harmonious with the natural landscape.

Officially designated state scenic highways in Sonoma County include California State Route 116 and California State Route 12 from eastern Santa Rosa to the unincorporated community of Boyes Hot Springs (Caltrans 2018).

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The Sonoma County General Plan Open Space and Resource Conservation (OSRC) element includes the following relevant policies related to Scenic Corridors and aesthetics:

Policy OSRC-3a: Apply the Scenic Resources combining district to those portions of properties within Scenic Corridor setbacks.

Policy OSRC-3b: For development on parcels located both within Scenic Landscape Units and adjacent to Scenic Corridors, apply the more restrictive siting and setback policies to preserve visual quality.

Policy OSRC-3c: Establish a rural Scenic Corridor setback of 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the road unless a different setback is provided in the Land Use Policies for the Planning Areas. Prohibit development within the setback with the following exceptions:

(1) New barns and similar agricultural support structures added to existing farm complexes on parcels in the Diverse Agriculture, Land Extensive Agriculture, Land Intensive Agriculture, and Resources and Rural Development land use categories, and on parcels in the Rural Residential land use category with Agriculture and Residential (AR) Zoning, provided that such structures proposed within a State Scenic Highway or where local design review exists by community choice in an adopted specific or area plan are subject to administrative design review.

(2) New barns and similar agricultural support structures that do not require a use permit in the Development Code on parcels in the Diverse Agriculture, Land Extensive Agriculture, Land Intensive Agriculture, and Resources and Rural Development land use categories, and on parcels in the Rural Residential land use category with Agriculture and Residential (AR) Zoning, provided that such structures proposed within a State Scenic Highway or where local design review exists by community choice in an adopted specific or area plan are subject to administrative design review.

(3) Maintenance, restoration, reconstruction, or minor expansion of existing structures.

(4) Telecommunication facilities that meet the applicable criteria established in the Development Code.

(5) Other new structures if they are subject to design review and (a) they are associated with existing structures, (b) there is no other reasonable location for the structure, (c) the location within the setback is necessary for the use, or (d) existing vegetation and topography screen the use.

(6) Compliance with the setback would render the parcel unbuildable.

(7) Satellite dishes that are not visible from the roadway. signs subject to the limitations of State law as a condition of approval for discretionary permits.

Policy OSRC-4a: Require that all new development projects, County projects, and signage utilize light fixtures that shield the light source so that light is cast downward and that are no more than the minimum height and power necessary to adequately light the proposed use.

Policy OSRC-4b: Prohibit continuous all night exterior lighting in rural areas, unless it is demonstrated to the decision-making body that such lighting is necessary for security or operational purposes or that it is necessary for agricultural production or processing on a seasonal basis. Where lighting is necessary for the above purposes, minimize glare onto adjacent properties and into the night sky.

Policy OSRC-4c: Discourage light levels that are in excess of industry and State standards.

Sonoma County Code of Ordinances

The following policies from the Sonoma County Zoning Regulations (Chapter 26) are relevant to the proposed Project:

Article 64. - SR Scenic Resources Combining District

Sec. 26-64-030: The following provisions shall apply to properties along scenic corridors illustrated on Figures OS-5a through OS-5i, inclusive, of the general plan open space element unless otherwise provided herein:

(a) All structures located within scenic corridors established outside of the urban service area boundaries shown on Figures LU-5a through LU-5i, inclusive, of the general plan land use element shall be subject to the setbacks of thirty percent (30%) of the depth of the lot to a maximum of two hundred feet (200′) from the centerline of the road. Development within the setback shall be prohibited with the following exceptions, where such uses are allowed by the base district with which this district is combined:

(3) Maintenance, restoration, reconstruction or minor expansion of existing structures;

(5) Other new structures provided they are subject to design review and

i. They are associated with existing structures,

ii. There is no other reasonable location for the structure,

4.1.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the Project would have a significant impact if it would:

a) Have a substantial adverse effect on a scenic vista;

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; or,

d) *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.*

APPROACH TO IMPACT ANALYSIS

For the purposes of a CEQA analysis, aesthetic impacts are assessed using methodologies that identify and describe the visual resources within the Project area, determining the level of quality from public viewing locations, and estimating the level of effect changes to those views would produce. This analysis relies on the County's Visual Assessment Guidelines, which provide specific steps and criteria for evaluating visual impacts in the preparation of Initial Studies and Environmental Impact Reports (County of Sonoma 2019). In brief, the procedure involves determining public viewing points and describing the existing setting for each site, reviewing photographs of the site to understand potential impacts, characterizing the site's sensitivity following the matrix offered in Table 4.1-1, and determining the potential visual dominance of the proposed Project based on criteria described in Table 4.1-2 below. Based on this evaluation, a potential impact is determined in the *Project Impacts and Mitigation Measures* section below.

As addressed in the impact analysis, aesthetics refers to visual impacts to the environment, both natural and built, and includes changes that reduce visual quality along with potential increases in glare or light in the Project area. The impact analysis assesses the visible change and anticipated viewer response to the change.

Site Sensitivity

The visual sensitivity of the Project area is determined by the County's criteria that generally characterizes a site relative to its aesthetic value to the surrounding setting (County of Sonoma 2019). This determination considers both the site itself and the setting in which the site is located. The County's site sensitivity criteria is presented below in Table 4.1-1.

Table 4.1-1. Site Sensitivity Criteria

SITE SENSITIVITY LEVEL	SUMMARY OF SITE CRITERIA
Maximum	1. Designated scenic resource, corridor, or landscape unit, or community separator 2. Natural setting, scenic backdrop 3. Visible from designated scenic corridor because of slope or situation on a ridgeline
High	1. Designated scenic resource, corridor, or landscape unit, or community separator 2. Natural setting, scenic backdrop 3. Visible from scenic corridor, public roads, or other public use areas (parks, trails, etc.) because of slope or situation on a ridgeline
Moderate	1. Rural land use designation or urban designation that is not low sensitivity, but which has no scenic resource designation 2. May be near a gateway or include historic resources 3. Visible because of slope (less than 30 percent) or where significant aesthetic features are visible from public roads or public uses areas (parks, trails, etc.)
Low	1. In an urban land use designation with no scenic resource zoning protections 2. Vicinity is characterized by urban development or the site is surrounded by urban zoning designations

	a. No historic character b. Not a gateway to a community 3. Slope less than 20 percent and not on a prominent ridgeline 4. No significant natural vegetation of aesthetic value to surrounding community

Source: County of Sonoma 2019

Describing a site's visual character involves identifying both natural and human-made landscape features that shape the appearance of an area or view. This information helps determine the site's visual sensitivity, as well as that of the surrounding environment that could be affected by the proposed Project. Factors considered in this assessment include geology, water features, vegetation, wildlife, as well as architectural and transportation elements like bridges and roadways. Visual character can also change depending on the season, time of day, lighting conditions, and other factors that influence what is visible. Key components used to define visual character include the form, line, color, and texture of landscape features, along with the level of light and glare under current conditions (County of Sonoma 2019).

Visual Dominance

After determining the site sensitivity, the visual dominance is determined based on how prominent a Project would be when developed. The visual dominance criteria are based on the County's guidelines and are presented below in Table 4.1-2.

Table 4.1-2. Visual Dominance

DOMINANCE	CHARACTERISTICS
Dominant	Project elements are strong – they stand out against the setting and attract attention away from the surrounding landscape. Form, line, color, texture, and night lighting contrast with existing elements in the surrounding landscape.
Co-Dominant	Project elements are moderate – they can be prominent within the setting, but attract attention equally with other landscape features. Form, line, color, texture, and night lighting are compatible with their surroundings.
Subordinate	Project is minimally visible from public view. Element contrasts are weak – they can be seen but do not attract attention. Project generally repeats the form, line, color, texture, and night lighting of its surroundings.
Inevident	Project is generally not visible from public view because of intervening natural land forms or vegetation.

Source: County of Sonoma 2019

Impact Determination

After determining the site sensitivity and visual dominance, the visual impact significance is determined by comparing the sensitivity with the visual dominance evaluations such that higher levels of sensitivity and visual dominance combine to create significant impacts and lesser ones to create less-than-significant impacts, as shown in Table 4.1-3. Once the impact is determined, the County guidelines offer measures designed to reduce impacts through design, landscaping, materials, screening, and limited lighting. These measures are applied to projects where potential impacts are found to be significant.

Table 4.1-3. Thresholds of Significance for Visual Impact Analysis

SENSITIVITY	DOMINANT	CO-DOMINANT	SUBORDINATE	INEVIDENT
MAXIMUM	Significant	Significant	Significant	Less than significant
HIGH	Significant	Significant	Less than significant	Less than significant
MODERATE	Significant	Less than significant	Less than significant	Less than significant
LOW	Less than significant	Less than significant	Less than significant	Less than significant

Source: County of Sonoma 2019

As described above, once the site sensitivity and visual dominance of the Project is determined, the determination of visual impact significance is made by:

1. Establishing the level of visual sensitivity of the site using the criteria presented in Table 4.1-1.
2. Characterizing the visual dominance of the Project by comparing the Project's form, line, color, texture, and lighting against that of the surrounding area as described in Table 4.1-2.
3. Determining significance of the visual impact by comparing site sensitivity with visual dominance of the Project in accordance with Table 4.1-3.

Based on the above criteria presented in Table 4.1-1 and Table 4.1-2, the Project site sensitivity was classified as High and the visual dominance was classified as Subordinate. Using Table 4.1-3, the aesthetic impacts of the Project would be less than significant, as described in detail below.

PROJECTS IMPACTS AND MITIGATION MEASURES

a) Would the project have a substantial adverse effect on a scenic vista?

A scenic vista is typically described as a visually striking or panoramic view that is valued for its natural beauty, cultural significance, or aesthetic appeal. These views often include expansive landscapes, such as mountains, valleys, coastlines, or urban skylines. Sonoma County offers scenic vistas that are characterized by a unique scenic beauty that combines agriculture, viticulture, and natural areas such as foothills, oak woodlands, riparian areas, and grazing lands. The General Plan OSRC Element characterizes several types of scenic resources, including Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways (County of Sonoma 2008). The County's zoning code also establishes the VOH combining district which protects valley oaks and valley oak woodlands for their habitat and aesthetic value. The Project site is located in a Scenic Corridor for Chalk Hill Road and contains portions of VOH-zoned parcels.

The Project is in a bucolic agricultural region of the County dominated by grape vines, oak trees, hills and mountains in the background. Motorist views of the existing bridge are of relatively

short duration due to the winding nature of the roadway, trees and intervening topography. Views of the existing arch structure are limited -- the best views are from the creek bed from viewpoints accessible only by foot. Motorist views of the replacement bridge will also be of short duration, and views of the scour countermeasures will be limited. The scour countermeasures, new box girder bridge and retaining walls along the west edge of roadway would be best viewed from the creek bed from viewpoints accessible only by foot. Photos of the existing bridge and visual simulations of the replacement bridge are shown in Figures 4.1-1 through 4.1-3.

Primary views of the new bridge would consist of the roadway and bridge barriers with very limited views of the box girder when approaching from the south. Changes in bridge views as experienced occupants of vehicles traveling along Chalk Hill Road in either direction would be minimal due to the similar location and position of the new bridge as compared with the existing bridge. These changes would likely be experienced as positive in attribute given the reduction in roadway curvature at the south end of the new bridge.

The Project is designed so as to avoid the introduction of contrasting elements to the existing landscape. The Project will also include the replanting of riparian vegetation and native trees to soften views of the replacement bridge and its approaches. Cuts will be kept to a minimum. Abandoned approach roadways will be stripped of pavement, ripped to a depth of two feet, and replanted. Sloped fills will be also replanted to make the bridge site more compatible with its surroundings. With these design features, the Project would not substantially alter the existing visual character of the Project area.

Construction of the Project would have temporary visual impacts such as the presence of construction equipment and materials on-site. In addition, the Project would require the removal of approximately 33 trees, some of which may be valley oak trees and other native tree species (see *Section 4.4, Biological Resources*, for additional detail). As described in *Section 2.0, Project Description,* all trees removed for construction would be replaced in kind with native tree species. The visual impact of construction would be temporary, and the site would be cleaned and replanted once construction is finished. Therefore, this impact would not have a substantial adverse effect on a scenic vista. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

There are no state scenic highways within the vicinity of the Project site. The nearest officially designated state scenic highway is State Route 12, approximately 14.8 miles south of the Project site (Caltrans 2018). The nearest eligible state scenic highway is State Route 29, located approximately 9.4 miles east of the Project site (Caltrans 2018). The Project site is not visible from either of these highways. Therefore, the Project would not substantially damage scenic resources within a state scenic highway. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

c) In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

According to PRC Section 21070, an "urbanized area" is defined as the following:

a) An incorporated city that meets either of the following criteria:

1. Has a population of at least 100,000 persons
2. Has a population of less than 100,000 persons but the population of that city and no more than two contiguous incorporated cities combines equals at least 100,000 persons,

b) An unincorporated area that satisfies the criteria in both (1) and (2) of the following criteria:

1. Is either of the following:

A) Completely surrounded by one or more incorporated cities, and both of the following criteria are met:

(i) The population of the unincorporated area and the population of the surrounding incorporated city or cities equals not less than 100,000 persons.

(ii) The population density of the unincorporated area at least equals the population density of the surrounding city or cities.

B) Located within an urban growth boundary and has an existing residential population of at least 5,000 persons per square mile.

2. The board of supervisors with jurisdiction over the unincorporated area has previously taken both of the following actions:

A) Issued a finding that the general plan, zoning ordinance, and related policies and program applicable to the unincorporated area are consistent with principles that encourage compact development in a manner that does both of the following:

(i) Promotes efficient transportation systems, economic growth, affordable housing, energy efficiency, and appropriate balance of jobs and housing.

(ii) Protects the environment, open space, and agricultural areas.

B) Submitted a draft finding to the Office of Planning and Research (now the Office of Land Use and Climate) at least 30 days prior to issuing a final finding, and allowed the office 30 days to submit comments on the draft findings to the board of supervisors.

The Project is located in an unincorporated area of eastern Sonoma County. The nearest incorporated city to the Project site is Healdsburg, with the eastern city boundary located approximately four miles west of the site. Therefore, the Project is not completely surrounded by

one or more incorporated cities. The Project site is not located within the Urban Growth Boundary of the City of Healdsburg (Permit Sonoma 2024). Therefore, the Project is not located in an unincorporated area that satisfies both (1) and (2) of the above criteria. Accordingly, the Project site is in a non-urbanized area.

As described above in Threshold a), the Project would have a less-than-significant impact on the visual character and quality of the Project area. Although Project construction would introduce visual impacts such as the presence of construction equipment and materials on-site, this impact would be temporary and therefore would not be substantial. As such, the Project would not substantially degrade the existing visual character or quality of public views in a non-urbanized area. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The Project would temporarily increase the potential for glare as a result of construction activities. Activities that could potentially increase light and glare during construction include the use of heavy equipment and construction of the new bridge, demolition of the existing bridge, and removal of vegetation to accommodate construction activities. This impact would be temporary during Project construction; therefore, it would not create a substantial new source of light or glare that would impact day or nighttime views in the Project area.

There are no lights, including streetlights, on the existing bridge or within the Project site. The new bridge would not include any lights. The only source of nighttime lighting would be from vehicle headlights, which is the same as under existing conditions. Therefore, no permanent new sources of light or glare would result from the Project. The impact would be ***less than significant.***

Mitigation Measures

No mitigation measures are required.

4.2 Agricultural and Forestry Resources

This section describes the existing agricultural and forestry setting of the Project site, identifies associated regulatory requirements, evaluates potential Project impacts, and identifies any mitigation measures necessary to reduce impacts of the proposed Project on agricultural and forestry resources.

4.2.1 Setting

REGIONAL SETTING

Agriculture is one of the most prominent industries in Sonoma County and provides a significant base for the County's economy. As shown in Table 4.2-1, total production value for the County's agricultural sector in 2023 was $945,722,700, which represented an 18.8 percent increase from the 2022 value of $796,024,800 (County of Sonoma 2023). The most profitable crop is wine grapes, which benefit from the excellent growing conditions that Sonoma County offers. Other profitable crops include milk, livestock and poultry products, nursery products, and cattle.

Table 4.2-1. 2023 Sonoma County Crop Values

CROP	VALUE
Winegrapes – all	$716,818,600
Milk	$58,348,700
Miscellaneous Livestock and Poultry Products	$40,652,100
Nursery – Ornamentals	$31,462,600
Cattle and Calves	$21,013,400
Nursery – Miscellaneous	$20,503,500
Miscellaneous Livestock and Poultry	$12,557,200
Nursery – Bedding Plants	$9,359,800
Nursery – Cut Flowers	$6,108,000
Sheep and Lambs	$5,404,200
Rye and Oat Hay Crops	$2,808,800
Vegetables	$2,190,800
Apples- Late Varieties	$1,834,700
Apples – Gravenstein	$1,742,300
Rye, Corn, and Oat Silage Crops	$1,215,100

Source: County of Sonoma 2023

IMPORTANT FARMLAND

The U.S. Soil Conservation Service divides farmland into five classes based on the productive capability of the land in addition to their soil conditions, as described below.

1. **Prime Farmland** has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Lands must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

2. **Farmland of Statewide Importance** is similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to retain soil moisture. Lands must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
3. **Unique Farmland** is farmland with lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non irrigated orchards or vineyards as found in some climatic zones in California. Lands must have been cropped at some time during the four years prior to the mapping date.
4. **Farmland of Local Importance** is of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
5. **Grazing Land** is land on which the existing vegetation is suited to the grazing of livestock.

The California Department of Conservation (CDOC) operates the Farmland Mapping and Monitoring Program (FMMP), which evaluates and tracks changes in economically significant farmland across the state. The program produces Important Farmland Maps that integrate data on soil quality, agricultural productivity, and current land use to assess the risk of conversion to non-agricultural uses. The total acreage of Sonoma County designated as agricultural land is approximately 326,562 acres, or 34.1 percent of the total acreage of the County (University of California Agriculture and Natural Resources 2025).

4.2.2 Regulatory Setting

FEDERAL REGULATIONS

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) aims to limit the unnecessary and irreversible conversion of farmland to non-agricultural uses resulting from federal programs. It requires that, wherever feasible, federal activities align with state, local, and private efforts to protect farmland. Projects fall under FPPA jurisdiction if they involve federal agency review or assistance and may directly or indirectly lead to the permanent conversion of farmland to nonagricultural use. Under FPPA, the definition of farmland includes Prime Farmland, Unique Farmland, and land of Statewide or Local Importance. This includes cropland, pastureland, and forest land, even if not actively farmed, but excludes developed urban land such as residential, commercial, or industrial areas, as well as water bodies.

The Natural Resources Conservation Service (NRCS) oversees implementation of the FPPA and uses a Land Evaluation and Site Assessment system to assign a farmland conversion impact rating score to proposed federally funded or assisted project sites. This score helps project sponsors assess whether alternative sites should be considered when the potential impact on farmland exceeds recommended thresholds.

Farm Bill Conservation Program

The Food, Conservation, and Energy Act of 2008 (commonly known as the 2008 Farm Bill) allocated funding to support several farmland and natural resource conservation initiatives administered by the NRCS. These programs include the Farm and Ranch Lands Protection Program, Wetland Reserve Program, Grassland Reserve Program, Conservation of Private Grazing

Land Program, Conservation Reserve Program, Conservation Stewardship Program, Environmental Quality Incentives Program, Agricultural Water Enhancement Program, and Wildlife Habitat Incentives Program.

U.S. Department of Agriculture, U.S. Forest Service

The U.S. Forest Service, an agency within the U.S. Department of Agriculture, is responsible for managing public lands within the nation's national forests and grasslands. In addition to land management, the agency offers technical and financial support to state and private entities committed to conserving the health, diversity, and productivity of forest and grassland ecosystems for the benefit of current and future generations.

STATE REGULATIONS

Farmland Mapping and Monitoring Program

The CDOC, through its Division of Land Resource Protection, established the FMMP to track changes in agricultural land use across the state. The program collects county-level data to generate maps categorizing land into eight distinct use classifications. It issues biennial reports detailing the extent of farmland converted to non-agricultural uses. These maps and associated statistics are key tools for evaluating impacts on California's agricultural resources. Farmland is classified based on factors such as soil quality and irrigation capability, with the highest quality land designated as Prime Farmland, consistent with federal classification standards (CDOC 2025).

Williamson Act

The Williamson Act, officially known as the California Land Conservation Act of 1965, allows local governments to enter into voluntary contracts with private landowners to preserve agricultural and open space lands through property tax incentives. The program's goal is to prevent the premature or unnecessary conversion of productive farmland to urban development. In exchange for agreeing to restrict land use to agricultural or compatible purposes, landowners receive reduced property tax assessments based on the land's agricultural value rather than its market value. These contracts operate on a rolling 10-year term, automatically renewing each year unless a notice of nonrenewal is filed by either the landowner or the County. Sonoma County has adopted its own set of regulations to administer the local Williamson Act program.

California Timberland Productivity Act

To ensure the long-term availability of timber resource lands, the California Timberland Productivity Act of 1982 (Government Code Section 65302) mandates that counties designate timberlands in their General Plans and establish "Timberland Production" zones, where land uses are restricted primarily to timber harvesting and related activities.

Forest Practice Act

The Forest Practice Act of 1973 was enacted to ensure that logging activities in California are conducted in a way that protects the state's fish, wildlife, forests, and waterways. The California Department of Forestry and Fire Protection (CAL FIRE) is responsible for enforcing this Act and the associated Forest Practice Rules, which were established by the State Board of Forestry. These regulations apply to all commercial timber harvesting operations, from small private landowners to large-scale timber companies. While certain exemptions may apply in specific

cases, most timber harvests must comply with the Forest Practice Act. As part of the process, landowners are required to submit a Timber Harvesting Plan to CAL FIRE, which serves as the environmental review document. The Timber Harvesting Plan outlines the proposed harvesting activities, methods to be used, and measures that will be implemented to avoid or minimize environmental impacts.

REGIONAL AND LOCAL REGULATIONS

Agricultural Preserve and Open Space District

The Agricultural Preservation and Open Space District is a special district aimed at protecting agricultural, open space, natural resource, and recreational lands that is funded by a 0.25 percent sales tax. As of 2020, the Agricultural Preservation and Open Space District has preserved approximately 32,500 acres of agricultural lands via conservation easements throughout the County.

Sonoma County Local Agency Formation Commission (Agricultural Lands Policy)

The Sonoma County Local Agency Formation Commission (LAFCO) is established under the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (Government Code Section 56000, et seq.). The LAFCO's function is to "review and approve with or without amendment, wholly, partially, or conditionally, or disapprove proposals for changes of organization or reorganization, consistent with written policies, procedures, and guidelines adopted by the commission" (Government Code Section 56375). This gives LAFCO exclusive power to consider city incorporations, city annexations, and the creation of or addition to special districts. Sonoma LAFCO's Agricultural Lands Policy requires that, in addition considering the policies in Government Code Section 56377, the Commission shall conform to the following policies in reviewing and approving or disapproving proposals that may result in the conversion of agricultural land to non-agricultural uses:

1. Agricultural significance of the subject territory and adjacent areas relative to other agricultural lands in the region
2. Use of the subject territory and adjacent areas
3. Whether public facilities for proposed development would be a) sized or situated to facilitate conversion of adjacent or nearby agricultural land, or b) extended through agricultural lands that lie between the Project site and existing facilities
4. Whether uses incompatible with adjacent agricultural uses are expected to result from the proposal and whether natural or man-made barriers would buffer adjacent or nearby agricultural lands from the effects of proposed development or other incompatible uses
5. Whether the subject territory is located within the sphere of influence of a city or district providing sewer and/or water service or in an "Urban Service Area" designation of the Sonoma County General Plan
6. Provisions of applicable general plan open space and land use elements, growth management policies, or other statutory provisions designed to protect agriculture

The Sonoma County LAFCO is mandated to discourage development that would likely convert to urban uses those lands identified by the County General Plan as suitable for long-term agricultural or open space use or identified by the Sonoma County Agricultural Preservation and Open Space District Acquisition Plan as a priority for acquisition or protection in cooperation with willing landowners (Sonoma County LAFCO 2013).

Sonoma County General Plan

The Sonoma County General Plan Agricultural Resources Element establishes policies to ensure the stability and productivity of the County's agricultural lands and industries and provides guidelines for decisions in agricultural areas. The General Plan contains the following applicable policy to promote and protect local agriculture and forestry:

> **Policy AR-2a:** Apply agricultural land use categories based on the capability of the land to produce agricultural products. Unless allowed by the Public Facilities and Services Element, limit extension of sewer service to these lands except by out-of-district agreement to solve a health and safety problem.

Sonoma County Code of Ordinances

Sonoma County Zoning Regulations include three agricultural use categories: Land Intensive Agriculture (LIA), Land Extensive Agriculture (LEA), and Diverse Agriculture (DA) (Sonoma County Code Chapter 26, Article 6.). Portions of the Project site are designated as LIA, which aims to enhance and protect lands best suited for permanent agricultural use and capable of relatively high production per acre of land. Restricted non-agricultural uses in the LIA zone may be allowed if the applicant demonstrates that a) the use meets a local need, b) the use avoids conflict with agricultural activities, and c) the use is consistent with General Plan **Objective AR-4.1** and **Policy AR-4a.**

4.2.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the Project would have a significant impact if it would:

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;*
b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract;*
c) *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland(as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));*
d) *Result in a loss of forest land or conversion of forest land to non-forest use; or,*
e) *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.*

PROJECT IMPACTS AND MITIGATION MEASURES

a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The Project site is mapped by the CDOC as Grazing Land, Farmland of Statewide Importance, Farmland of Local Importance, and some small portions of Unique Farmland (CDOC 2022). Most

of the Project work would occur within the County's right of way, which is not considered farmland of any type. The Project would require permanent acquisition of small portions of parcels 132-060-013, 132-080-023, 132-080-022, and potentially parcels 132-060-011 and 132-080-003, all of which are zoned for Land Intensive Agriculture. The affected areas are located adjacent to the existing roadway corridor and represent a minor portion of the overall agricultural properties. The Project would not substantially reduce the amount of land available for agricultural production, impair the long-term agricultural viability of the affected parcels, or convert agricultural land to a nonagricultural use beyond the limited area needed for transportation improvements. Agricultural operations on the remaining portions of the parcels would be able to continue. Therefore, the Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use to a degree that would result in a significant impact.

In addition, during construction, portions of land on private parcels within the Project site would be used for construction staging areas. These areas are shown on Figure 2-5 in *Section 2.0, Project Description*, and include portions of APNs 132-060-013, 132-080-022, and 132-080-017. Staging within these areas would be within areas characterized as Grazing Land, Farmland of Statewide Importance, and Farmland of Local Importance, which would be a temporary impact during construction. No ground disturbance would be required for the staging areas on parcels 132-080-022 and 132-080-017; however, some minor ground disturbance would be required on APN 132-060-013. This work would be on the very edge of the parcel outside of the area that is currently used as a vineyard. The use of these areas for staging would temporarily limit agricultural operations during Project construction; however, it would not impact the long-term viability of the areas for agricultural production or convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. The impact would be ***less than significant.***

MITIGATION MEASURES

No mitigation measures are required.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

According to the Williamson Act Contract map prepared by Sonoma County, there are no parcels under a Williamson Act contract encompassed in the Project site (Sonoma County Permit and Resource Management Department [PRMD] 2017). Therefore, the Project would not conflict with a Williamson Act contract. The Project site is zoned as Land Intensive Agriculture, which is meant to enhance and protect lands best suited for permanent agricultural use and capable of relatively high production per acre of land. As described above in Impact a), the majority of Project work would occur within Sonoma County's right of way, which does not have a specific zoning designation. During construction, portions of private parcels zoned as Land Intensive Agriculture would be used for staging for construction equipment; however, this would be a temporary impact during construction work. No permanent impact to lands within the Land Intensive Agriculture district would occur that would conflict with applicable uses for the zoning district. The impact would be ***less than significant.***

MITIGATION MEASURES

No mitigation measures are required.

c, d) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland(as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? Would the project result in a loss of forest land or conversion of forest land to non-forest use?

There is no forest land or timberland within the Project site. The Project site includes Sonoma County right of way and surrounding private parcels zoned for agricultural use. Therefore, the Project would not conflict with existing zoning for forest land or timberland and would not result in a loss of forest land or conversion of forest land to non-forest use. ***No impact*** would occur.

MITIGATION MEASURES

No mitigation measures are required.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

The Project would replace the existing Chalk Hill Road bridge by constructing a new replacement bridge and demolishing the existing bridge. The Project would not require the permanent take of any agricultural land. Traffic would be switched onto the new bridge once it is built, and the existing bridge would be demolished. These changes would not result in the conversion of Farmland to non-agricultural use.

All disturbed areas would be revegetated with native species once ground-disturbing work is complete. The planting plan would only include native species; therefore, changes associated with vegetative communities would not pose a risk of converting agricultural land to non-agricultural use. The impact would be ***less than significant***.

MITIGATION MEASURES

No mitigation measures are required.

4.3 Air Quality

4.3.1 Introduction

This section describes the existing air quality setting of the Project site and region, identifies associated regulatory requirements, evaluates potential Project-level and cumulative impacts, and identifies mitigation measures as necessary to reduce the proposed Project's air quality impacts.

The information presented in this section is based on the Air Quality Assessment prepared by Illingworth & Rodkin, Inc. in July 2025 (Appendix B).

4.3.2 Setting

The Project site is in Northern Sonoma County, which is part of the North Coast Air Basin under the jurisdiction of the Northern Sonoma County Air Pollution Control District (NoSoCo Air District). Ambient air quality standards have been established at both the State by the California Air Resources Board (CARB) and at the federal level by the United States Environmental Protection Agency (EPA). The North Coast Air Basin meets all established ambient air quality standards. However, the NoSoCo Air District is located adjacent to the San Francisco Bay Area Air Basin under the jurisdiction of the Bay Area Air District, formerly known as the Bay Area Air Quality Management District. The Bay Area meets all ambient air quality standards except for ground-level ozone, respirable particulate matter (PM10), and fine particulate matter (PM2.5).

BAY AREA AIR POLLUTANTS OF CONCERN

Ozone

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NOx) and aggravate respiratory and cardiovascular diseases, reduce lung function, and increase coughing and chest discomfort. These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. Therefore, high ozone concentrations are not often measured in the NoSoCo Air District jurisdiction.

Particulate Matter

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM10) and fine particulate matter where particles have a diameter of 2.5 micrometers or less (PM2.5). Elevated concentrations of PM10 and PM2.5 are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children. Construction projects can temporarily increase PM10 and PM2.5 concentrations closest to the activity, but if managed well, will not contribute to exceedances of ambient air quality standards.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer). TACs are found in ambient air and are caused by industrial and construction activities, agriculture operations, fuel combustion, and commercial operations (e.g., dry cleaners and gas stations). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a construction site). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel Particulate Matter

Diesel exhaust is the predominant TAC associated with roadway and bridge construction projects. According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complicated scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

SENSITIVE RECEPTORS

Groups of people more affected by air pollution than others are referred to as sensitive receptors. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Therefore, residential locations are assumed to include infants and small children. The closest sensitive receptors to the Project site are children that may be living in the single-family houses adjacent to Chalk Hill Road nearest the bridge.

4.3.3 Regulatory Setting

FEDERAL REGULATIONS

U.S. Environmental Protection Agency

The EPA sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining activities (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, if they are the same or more stringent than the federal standards.

In the past decade, the EPA has established several emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of nitrogen oxides, or NOx, and particulate matter (PM10 and PM2.5) and because the EPA has identified DPM as a probable carcinogen. Implementation of the current heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce particulate matter (PM) and NOx emissions from diesel

engines up to 95 percent by 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with EPA emission standards (U.S. EPA 2000).

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The current EPA standard for sulfur content in diesel fuel is 15 parts per million weight. This low sulfur highway fuel, also referred to as ultra-low sulfur diesel, is required for use by all vehicles in California.

STATE REGULATIONS

California Air Resources Board

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (CARB 2000). In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the federal on-road and non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

CARB has adopted and implemented several regulations for stationery and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or to have their engines replaced to meet 2010 or later engine standards which have much lower DPM and PM2.5 emissions. This regulation has substantially reduced emissions over the last decade. While new trucks and buses will meet stricter federal standards, CARB regulations continue to accelerate the rate at which the fleet either turns over or is retrofitted to meet higher emissions standards.

CARB has also adopted and implemented regulations to reduce DPM and NOx emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower or greater. The regulations are intended to reduce particulate matter and NOx exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent federal off-road equipment engine emission limits for new vehicles, will continue to reduce emissions of DPM and NOx.

REGIONAL AND LOCAL REGULATIONS

Sonoma County Transportation Authority

The Sonoma County Transportation Authority (SCTA) was created in 1990 and is governed by a twelve-member Board of Directors representing each of the nine cities (Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor) and the Sonoma County board of Supervisors. It acts as the countywide planning and fund programming agency for transportation and performs a variety of important functions related to advocacy,

project management, planning, finance, grant administration and research. SCTA is responsible for prioritizing most state and federal funds available to Sonoma County for roadway, transit, bicycle, and pedestrian projects. Additionally, SCTA serves as the entity responsible for planning and prioritizing transportation improvement projects at a countywide level and provides project management in partnership with Caltrans on the State Highway system.

SCTA and Sonoma County are both part of the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), which serve as the metropolitan planning organization for the Bay Area. ABAG and MTC develop the regional transportation plans and transportation improvement programs for the Bay Area which are needed to allocate State and federal funding to transportation projects in Sonoma County.

Sonoma County General Plan

The Sonoma County General Plan contains the following relevant policies related to air quality:

> **Policy OSRC-16b:** Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.
>
> **Policy OSRC-16i:** Ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with applicable health standards. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another.

Northern Sonoma County Air Pollution Control District

The NoSoCo Air District has jurisdiction over the northern portions of unincorporated Sonoma County and the incorporated portions including Healdsburg, Cloverdale, and Windsor. The NoSoCo Air District is the lead agency in developing plans to address attainment and maintenance of ambient air quality standards and has permit authority over most types of stationary sources of pollution. It conducts inspection of stationary sources and enforces air quality regulations, including setting fees, levying fines, and imposing enforcement actions. The NoSoCo Air District is also responsible for ensuring that public nuisances are minimized. Many air districts have also established emissions thresholds for pollutants so that CEQA significance could be determined for both projects and plans. However, the NoSoCo Air District has not established specific CEQA thresholds or guidance.

The entire North Coast Air Basin operates under one set of Air Quality Control Rules (Rules). Chapter I covers general provisions, Chapter II Permits, Chapter III Fees, Chapter VI Prohibitions, Chapter V Enforcement & Penalty Actions, and Chapter VI covers Hearing Board & Variance Procedures. The emissions thresholds in the Rules primarily apply to stationary sources and is not applicable to construction emissions sources. However, Rule 430 – Fugitive Dust Emissions would apply to the Project. Rule 430 lists the reasonable precautions that shall be taken to prevent particulate matter from becoming airborne. They include, but are not limited to:

- Covering open bodied trucks when used for transporting materials likely to give rise to airborne dust.
- The use of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.

- The application of asphalt, oil, water or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
- The paving of roadways and their maintenance in a clean condition.
- The prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

4.3.4 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Conflict with or obstruct implementation of the applicable air quality plan:*

b) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;*

c) *Expose sensitive receptors to substantial pollutant concentrations; or,*

d) *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.*

APPROACH TO IMPACT ANALYSIS

Because the NoSoCo Air District does not have CEQA guidance documentation for significant impact determinations, the Bay Area Air District CEQA thresholds were used to determine the level of significance for Project construction and health risks.

Construction emissions were estimated using the latest version of the California Emissions Estimator Model (CalEEMod) which uses emission factors from CARB's on road vehicle emissions model, EMFAC2021. Construction equipment quantities and phases estimated by CalEEMod were used and adjusted, assuming a limit of no more than three pieces of any type of equipment. Construction was assumed to include both roadway construction and bridge construction with four "default" phases: Grubbing and Land Clearing; Grading and Excavation; Drainage, Utilities, & Sub-Grade; and Paving. Total Project emissions were adjusted to fit the proposed construction schedule, six months in 2027 and six months in 2028. The construction inputs utilized for the CalEEMod modelling are included in Appendix B.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Conflict with or obstruct implementation of the applicable air quality plan?

The NoSoCo Air District does not have an air quality plan that applies to the Northern Sonoma County Air Basin. However, as described above, the entire North Coast Air Basin operates under one set of Air Quality Control Rules. The only provision of the Rules that is applicable to the Project is Rule 430-Fugitive Dust Emissions which lists the reasonable precautions that shall be taken to prevent particulate matter from becoming airborne. These are often referred to as "best management practices" (BMPs) and are required for all construction projects in Northern

Sonoma County. The Project would be required to adhere to these Rules; therefore, the project would not conflict with any NoSoCo air quality plan.

The Sonoma County General Plan contains goals, objectives, and policies to protect air quality in Sonoma County. Specifically, Policy OSRC-16b encourages public transit and ridesharing and Policy OSRC-16i requires the County to ensure that any proposed new sources of TACs or odors provide adequate buffers to protect sensitive receptors and comply with applicable health standards. The proposed Project would not inhibit public transit or ridesharing and would not introduce any new permanent sources of TACs. Therefore, the Project would not conflict with any policies of the Sonoma County General Plan related to air quality.

The Project would not conflict with or obstruct implementation of the NoSoCo Air District Rules or policies of the Sonoma County General Plan. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The North Coast Air Basin is considered in attainment or unclassified for all criteria pollutants listed under both the Federal Clean Air Act and the California Clean Air Act. Therefore, the Project would not considerably increase emissions for any pollutant for which the air shed is in non-attainment so long as emissions are below the stationary source significance rates used to determine compliance with federal New Source Review (NSR) regulations. The NoSoCo Air District NSR rates are provided in Table 4.3-1.

Table 4.3-1. NoSoCo NSR Significant Emissions Rate

CRITERIA AIR POLLUTANT	EMISSIONS RATE (TON/YR)
VOC	40
NOx	40
PM10	15
PM2.5	10

The Bay Area is considered a non-attainment area for ground-level ozone and PM2.5 under both the Federal Clean Air Act and the California Clean Air Act and for PM10 under the California Clean Air Act. As part of an effort to attain and maintain ambient air quality standards for ozone and PM, the Bay Area Air District has established CEQA thresholds of significance for ozone precursors pollutants (ROG and NOx), PM10, and PM2.5 that apply to construction impacts. Given that the County is part of the Bay Area metropolitan planning area, and the fact that NoSoCo Air District has not established CEQA significance thresholds for projects in Northern Sonoma County, Bay Area Air District CEQA significance thresholds were used to assess the construction emissions impacts of the proposed Project. Table 4.3-2 summarizes the CEQA thresholds used for the analysis of construction impacts.

Table 4.3-2. Bay Area Air District CEQA Emissions Significance Thresholds

CRITERIA AIR POLLUTANT	CONSTRUCTION THRESHOLDS
	AVERAGE DAILY EMISSIONS (LBS/DAY)
ROG	54
NOx	54
PM10	82 (Exhaust)
PM2.5	54 (Exhaust)

Construction

Annual Project construction emissions were predicted using CalEEMod and allocated to either the 2027 or 2028 construction period based on the workdays for each phase provided by CalEEMod. This resulted in 2027 having 138 workdays and 2028 having 126 workdays for a total of 264. Average daily emissions were provided by CalEEMod for each year and adjusted to reflect the proposed construction schedule. Table 4.3-3 shows average daily construction emissions of ROG, NOx, PM10, and PM2.5 during construction of the Project. As indicated in Table 4.3-3, construction period emissions would not exceed the Bay Area Air District's CEQA significance thresholds.

Table 4.3-3. Project Construction Emissions Estimates

YEAR	SOURCE	VOC/ROG	NOX	PM10	PM2.5
2027	Emissions (tons per year)	0.46	3.67	0.40	0.18
	NSR Emissions Rates (tons per year)	*40*	*40*	*15*	*10*
	Exceed NSR Rate?	No	No	No	No
	Daily emissions (pounds per day)	2.50	20.09	2.21	0.98
	Bay Area Air District CEQA Threshold (pounds per day)	*54*	*54*	*82*	*54*
	Exceed Threshold?	No	No	No	No
2028	Emissions (tons per year)	0.08	0.66	0.06	0.03
	NSR Emissions Rates (tons per year)	*40*	*40*	*15*	*10*
	Exceed NSR Rate?	No	No	No	No
	Daily emissions (pounds per day)	1.17	11.87	0.54	0.47
	Bay Area Air District CEQA Threshold (pounds per day)	*54*	*54*	*82*	*54*
	Exceed Threshold?	No	No	No	No
Total/Average	Total Construction (tons)	0.54	4.33	0.28	0.21
	NSR Emissions Rates (tons per day)	*40*	*40*	*15*	*10*
	Exceed NSR Rate?	No	No	No	No
	Project average daily emissions (pounds per day)	4.07	32.8	2.13	1.58
	Bay Area Air District CEQA Thresholds (pounds per day)	*54*	*54*	*82*	*54*
	Exceed Threshold?	No	No	No	No

Construction activities, particularly during demolition, grubbing, land clearing, grading, and excavation would generate fugitive dust in the form of PM10 and PM2.5. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of materials. Unless properly controlled, vehicles leaving the site would deposit mud on Chalk Hill Road, which could be an additional source of airborne dust after it dries. The Bay Area Air District does not have a qualitative significance threshold for fugitive dust emissions; the implementation of fugitive dust control measures is considered sufficient to reduce impacts to a less-than-significant level. The Project is also subject to NoSoCo Air District's Rule 430 – Fugitive Dust Emissions, which requires certain BMPs for fugitive dust control. Therefore, Mitigation Measure AIR-1 would be implemented, which includes measures for fugitive dust control that must be implemented throughout Project construction. Measures include covering trucks carrying loose soils, covering dirt or soil stockpiles, limiting vehicle speeds on unpaved roadways, and other measures to prevent particulate matter from becoming airborne. With implementation of this measure, the Project would not result in a cumulatively considerable increase in any criteria air pollutant for which the region is in non-attainment. The impact would be ***less than significant with mitigation incorporated***.

Operation

Operational air emissions from the Project would be generated primarily from traffic using the new bridge and roadway connections. Implementation of the Project would not generate an increase in traffic along this segment of Chalk Hill Road. Therefore, the Project would not increase the total number of vehicle miles traveled (VMT) in the County, nor would it alter traffic speeds or volumes. Over time, total vehicle tailpipe emissions (i.e., ROG, NOx, and PM) are expected to decline as compared to existing conditions due to the gradual replacement of older vehicles with newer, less polluting vehicles being operated in the County. Planned population growth in Northern Sonoma County will cause an overall increase in traffic volumes and VMT in the region when compared to existing conditions. Increases in VMT would also increase fugitive road dust sources of PM10 and PM2.5, which include tire wear and break wear. However, these increases are anticipated to occur with or without the Project and the Project itself would not generate additional VMT. Operation of the Project would therefore result in a ***less than significant*** impact.

Mitigation Measures

Mitigation Measure AIR-1: Fugitive Dust Controls

During any construction period ground disturbance, the contractor shall ensure that the following BMPs are implemented to control dust:

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- On-site dirt piles or other stockpiled materials shall be covered, wind breaks installed, or water and/or soil stabilizers employed to reduce wind-blown dust emissions. The use of approved nontoxic soil stabilizers shall be incorporated according to manufacturers' specifications to all inactive construction areas.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping should only be performed in conjunction with thorough watering of the subject roads.
- All vehicle speeds on unpaved roads and surfaces shall be limited to 15 mph.
- The construction contractor shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints.

- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the total amount of disturbed surfaces at any one time.
- All transfer processes involving a free fall of soil or other materials shall be operated in such a manner as to minimize the free fall distance and fugitive dust emissions.
- Site access and staging area access routes to a distance of 100 feet from the paved road shall be treated with a 6-to12-inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Open burning shall be prohibited at the Project site. No open burning of vegetative waste (natural plant growth wastes) or other legal or illegal burn materials (e.g., trash, demolition debris) may be conducted at the Project site. Vegetative wastes shall be chipped or delivered to waste-to-energy facilities (permitted biomass facilities), mulched, composted, or used for firewood. It is unlawful to haul waste materials off-site for disposal by open burning.

c) Expose sensitive receptors to substantial pollutant concentrations?

Construction

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. Although it was concluded under Threshold b) that construction exhaust air pollutant emissions would not contribute substantially to existing or projected ambient air quality violations, construction exhaust emissions still pose health risks for sensitive receptors such as surrounding residents. To conduct the health risk assessment, on-site DPM emissions were estimated using CalEEMod, concentrations estimated using a dispersion model, and risks calculated using Bay Area Air District methodologies.

The CalEEMod model provided total annual PM10 exhaust emissions (assumed to be DPM) for the off-road construction equipment and on-road vehicles. Total uncontrolled DPM emissions from the construction site were estimated to be 0.18 tons (370 pounds). The on-road emissions are a result of haul truck travel during grading activities, worker travel, and vendor deliveries during construction. A trip length of a half mile was used to represent vehicle travel while at or near the construction site. It was assumed emissions from on road vehicles traveling at or near the site would occur at the construction site.

The maximum modeled annual DPM concentration, and thus the maximally exposed individual (MEI), was identified as persons living at a single-family residence adjacent to the east side of Chalk Hill Road (as shown in Figure 4.3-1). Using the maximum modeled annual DPM concentrations, maximum increased cancer risks were calculated using Bay Area Air District recommended methods and exposure parameters (Bay Area Air District 2023). Non-cancer health hazards were also calculated and identified.

Results indicate the unmitigated maximum increased cancer risks from construction exceed the Bay Area Air District CEQA significance threshold of greater than 10.0 per million for cancer risk, which is a potentially significant impact. The estimated non-cancer risk (Hazard Index) is well below the significance threshold. Mitigation Measure AIR-2 would be implemented to ensure that the Project cancer risk from construction would not exceed the 10.0 per million significance threshold.

Table 4.3-4 summarizes the maximum cancer risks and Hazard Index for Project-related construction activities affecting the off-site residential MEI. Implementing Mitigation Measure AIR-1 would reduce the increased cancer risk to nearby residential areas from construction, assuming infant exposure, by 83 percent.

Table 4.3-4. Construction Risk Impacts at the Off-site Residential MEI

SOURCE		CANCER RISK (PER MILLION)	HAZARD INDEX
Project Construction	Unmitigated	34.78 (infant)	0.21
	Mitigated	6.01 (infant)	<0.01
CEQA Threshold		*10*	*1.0*
Exceed Threshold?	Unmitigated	Yes	No
	Mitigated	No	No

As shown in Table 4.3-4, with implementation of Mitigation Measure AIR-2, construction emissions from the Project would not exceed cancer risk levels for the MEI. The impact would be ***less than significant with mitigation incorporated***.

Operation

The EPA has identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-hazard contributors from the 2011 National Air Toxics Assessment (U.S. EPA 2025). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (DPM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. The Federal Highway Administration (FHWA) considers these the priority mobile source air toxics (MSATs). EPA vehicle emissions and fuel standards will dramatically decrease MSAT emissions in the future through cleaner fuels and cleaner engines.

Per federal guidance, projects with no MSAT impacts generally include those that have no meaningful impacts on traffic volumes or vehicle mix (FHWA 2023). Projects that have low potential MSAT effects are those that serve to improve highway, transit, or freight operations or movement without adding substantial new capacity, or do not create a facility that is likely to substantially increase emissions. The proposed Project would not change the traffic mix nor create or significantly alter major roadways in the area. Therefore, operation of the Project would not result in a substantial increase in MSATs that would expose sensitive receptors to substantial pollutant concentrations. The impact would be ***less than significant***.

Mitigation Measures

Mitigation Measure AIR-2: Diesel Particulate Matter Exhaust

To mitigate potential cancer risks associated with Project construction, the Project proponent shall develop a plan demonstrating that the off-road equipment used on-site to construct the Project would achieve a fleet-wide average 72 percent reduction in DPM exhaust emissions or greater. One feasible plan to achieve this reduction would include the following:

- All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 4 Final engines. Where Tier 4 equipment is not available, exceptions could be made for equipment that includes CARB-certified Level 3 Diesel Particulate Filters or equivalent. Equipment that is electrically powered or uses non-diesel fuels would also meet this requirement.
- Idling time of diesel-powered construction equipment and trucks would be limited to no more than two minutes. Clear signage of this idling restriction would be provided for construction workers at all access points.
- The primary contractor shall be responsible for ensuring that all construction equipment is properly tuned and maintained before and for the duration of on-site operation.
- Where accessible, existing power sources (e.g., power poles) or clean-fuel generators shall be used rather than temporary power generators.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Some odors would be generated during Project construction due to the use of gasoline- and/or diesel-powered construction equipment that emit exhaust fumes. These activities would take place intermittently throughout the workday and the associated odors would dissipate within the immediate vicinity of the work area. Persons near the construction work area may find these odors objectionable; however, these impacts would be temporary during construction and would not be substantial. The Project would not include uses that are known as potential sources of objectionable odors, such as restaurants, manufacturing plants, landfills, and agricultural and industrial operations. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

4.4 Biological Resources

This section describes the existing biological resources in the Project site and vicinity, identifies associated regulatory requirements, evaluates potential Project-level impacts, and identifies mitigation measures necessary to reduce Project impacts on biological resources.

The information presented in this section is based on the Natural Environment Study (NES) prepared by WRA, Inc. (WRA) in November 2022 (Appendix C) and has been updated based on observed conditions from a follow-up site visit conducted by WRA in 2025.

4.4.1 Biological Study Area

The Biological Study Area (BSA) for the Project includes construction and access areas required to remove the existing bridge and construct the proposed replacement bridge, including those areas that could be directly or indirectly impacted by the Project, either temporarily or permanently. The BSA is shown below in Figure 4.4-1. The limits of the BSA were determined by reviewing Project plans and aerial photography, together with construction staging and design plans. The BSA is 16.09 acres and includes the permanent Project footprint, temporary construction work areas, and potential staging areas. The BSA includes the existing Chalk Hill Road bridge over Maacama Creek and portions of Maacama Creek, Chalk Hill Road, Young Road, and surrounding private parcels in agricultural use.

4.4.2 Setting

SUMMARY OF PREVIOUS STUDIES AND FIELDWORK

Chalk Hill Road Bridge Replacement Project at Maacama Creek, Natural Environment Study, (Caltrans 2022a, prepared by WRA, Inc.)

The NES (Appendix C) summarizes the results of the reconnaissance level surveys and assessments of the BSA on June 6, 2019 and September 14, 2021. The survey included evaluating the BSA for potential habitat for wildlife and signs of wildlife presence, and direct observations of wildlife. No special-status wildlife species were observed during the field surveys. The survey also included an inventory of plant species and vegetation communities present on-site to determine the potential presence of special-status plants.

Delineation of Potential Waters of the United States (Caltrans 2022g, Updated and Revised by WRA Inc. August 2025)

WRA staff conducted a formal wetland delineation within the BSA in November 2022. Potential state and federal wetlands were assessed in accordance with *Regional Supplement to the Corps of Engineers Wetland Delineation Manual* for Arid West (USACE 2008), which is a supplement to the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987). The field delineation included an on-site analysis of vegetation, soils, and hydrology within the BSA to determine potential wetland areas. The ordinary high-water mark (OHWM) was delineated in accordance with the Corps Regulatory Guidance Letter No. 05-15, *Ordinary High Water Mark Identification* (USACE 2005).

Due to the occurrence of several large storm events in the region during 2023-2025, WRA staff performed a supplemental wetland delineation within the BSA in July 2025 to revise the conclusions from the November 2022 delineation.

Chalk Hill Road Bridge Replacement, Biological Assessment, (Caltrans 2022b, prepared by WRA, Inc.)

The Biological Assessment (BA) provides technical information to the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) on the proposed Project in sufficient detail to determine to what extent the Project may affect federally listed fish species under the federal Endangered Species Act of 1973 (ESA) and Essential Fish Habitat for the Pacific Coast Salmon. In the BSA, there is potential for the federally and state endangered coho salmon – central California coast (CCC) evolutionary significant unit (ESU) (*Oncorhynchus kisutch*), federally threatened steelhead – CCC distinct population segment (DPS) (*Oncorhynchus mykiss*), and Chinook salmon – California coastal (CC) ESU (*Oncorhynchus tshawytscha*) to be present. In addition, Maacama Creek is designated critical habitat for CCC coho salmon and CCC steelhead. The BA provides conservation measures to avoid, minimize, and mitigate for potential impacts to salmonids. Caltrans, acting as the National Environmental Policy Act (NEPA) federal lead agency for the proposed Project, submitted the BA to NFMS on January 13, 2023, to initiate formal consultation under Section 7 of the federal ESA.

Rare Plant Surveys

Protocol-level surveys for special-status plant species following USFWS, California Department of Fish and Wildlife (CDFW), and California Native Plant Society (CNPS) survey guidelines and protocols (USFWS 1996, CDFW 2018, CNPS 2001) were conducted on April 15, May 16, and June 5, 2022. Surveys were timed to coincide with the blooming periods of special-status plant species identified as having the potential to occur within the BSA, based on suitable habitat and associated vegetative communities. No special-status plant species were observed during any of the three rare plant 2022 survey dates.

Arborist Assessment (Prepared by WRA Inc. August 2025)

A tree impact assessment was conducted by an ISA-certified arborist in August 2025 to assess the potential impacts of project activities on trees determined protected by Sonoma County and the CDFW (Appendix D). Measurements and health assessments data were collected in areas of the BSA within and immediately adjacent to Project components. The report outlines tree removal requirements as a result of the Project, and recommendations for satisfying County and State avoidance and mitigation requirements.

LITERATURE AND DATABASE REVIEW

As part of the NES and BA preparation, WRA conducted a literature, database, and aerial imagery review to determine if special-status biological resources are present or potentially present within or near the BSA. Sources used to determine if special-status biological resources are present or potentially present in or near the BRA include the following:

- CDFW California Natural Diversity Database (CNDDB) (CDFW 2021a) for the Healdsburg, Jimtown, Mount St. Helena, Mark West Springs, Santa Rosa, Sebastopol, Camp Meeker, Guerneville, Geyserville U.S. Geological Service 7.5’ Quadrangles (CDFW 2021b)
- USFWS official species list for the proposed project (USFWS 2021)
- CNPS Inventory of Rare, Threatened, and Endangered Plants of California records for the Healdsburg, Jimtown, Mount St. Helena, Mark West Springs, Santa Rosa, Sebastopol, Camp Meeker, Guerneville, Geyserville U.S. Geological Service 7.5’ Quadrangles (CNPS 2021)

- California Department of Fish and Game Publication “California’s Wildlife, Volumes I-III” (Zeiner et al. 1990)
- CDFW and University of California Press publication California Amphibian and Reptile Species of Special Concern (Thomson et al. 2016)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- University of California at Davis, Center for Watershed Sciences. Pisces: California Fish Data and Management Software (2021)
- NMFS Essential Fish Habitat Maps of California (2021)
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REGIONAL SETTING

The BSA is located within the Alexander Valley region in a rural, unincorporated area of Sonoma County, where Chalk Hill Road crosses Maacama Creek. The BSA is bordered by the Mayacamas Mountains to the east, and sits within the Russian River Valley itself, which is a relatively flat, wide expanse of land with gently rolling hills and fertile soils, creating an ideal environment for viticulture and agriculture. Its location along the Russian River provides natural irrigation and helps moderate the climate, while the surrounding mountains influence temperature variations. The western side of the valley experiences a cooler, fog-influenced climate due to the river's proximity and its connection to the Pacific Ocean, while the eastern side, including Alexander Valley, tends to be warmer and drier.

EXISTING CONDITIONS

Topography

Site elevations range from approximately 148 to 244 feet (NAVD88). The bed of Maacama Creek is composed mainly of gravel and cobble substrate with some larger boulders. During field surveys of the BSA, the banks of the creek were difficult to determine due to the historic drought, but evidence of very high flows was shown through deposits of debris high in the bridge abutments. Severe erosion along the southern bank has caused the top of bank to degrade to a sheer rock face approximately 30 feet high along the extent of Chalk Hill Bridge. The northern bank of Maacama creek has a more gradual slope. The BSA outside of the creek is mostly developed or managed low-density residential housing or agricultural lands on relatively flat ground.

Hydrology

Maacama Creek is a blueline stream that is typically perennial at this location. There was little to no water in the creek during the September 14, 2021, site visit due to the timing of the visit during an historic drought. Only a small, stagnant and receding pool approximately 6 feet wide, 30 feet long, and a maximum of 8 inches deep remained. However, on a site visit by a WRA biologist on June 6, 2019, there was continuous stream flow through the BSA. A follow up site-visit conducted in July 2025 revealed sediment accumulation had occurred upstream of the bridge since previous site visits, creating an in-stream wetland near the center of the previously delineated channel. The natural hydrology of the site is relatively intact; however, the watershed is developed with vineyards and rural residences. The principal natural hydrological sources for the BSA are creek flow from the upstream watershed, direct precipitation, and surface runoff from adjacent lands. The Maacama Creek watershed drains approximately 69.7 square miles and is a tributary of the Russian River. The confluence of Maacama Creek and the Russian River

is approximately 1.45 miles downstream of the BSA, with a tributary, Franz Creek, flowing into Maacama Creek between the confluence and the BSA.

Soils

The soils that occur in the BSA include the following:

- Laniger Loam, 5 to 9 percent slopes
- Laniger loam, 15 to 30 percent slopes
- Laniger loam, 30 to 50 percent slopes
- Haire clay loam, 0 to 9 percent slopes
- Cortina very gravelly loam, 0 to 2 percent slopes
- Riverwash

Soils are further described in *Section 4.7, Geology and Soils*.

Vegetation Communities and Land Cover Types

The BSA includes a mix of sensitive and non-sensitive land cover types and vegetation communities. Vegetation on-site generally consists of a mix of native and non-native plant species. Vegetation and land cover types are shown in Figure 4.4-1 and are described in further detail below.

Sensitive Land Cover Types

Perennial Stream
Maacama Creek is a typically perennial creek, though flows vary with the rainfall patterns of a given season and year. During the September 14, 2021, field survey by WRA biologists, only a small pool measuring 30 feet long by 6 feet wide and 8 inches deep was observed. The creek is a tributary of the Russian River and is supported by an approximately 70 square mile watershed (Sonoma RCD 2021). The creek substrate is composed of a mixture of gravel and cobble, with some larger stones throughout. Indicators of OHWM include a shift in vegetation and scour along the bank. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior. The formal wetland delineation determined that there is 0.94 acres of perennial stream within the BSA.

In-stream Wetland - Mulefat thicket (*Baccharis salicifolia* Shrubland Alliance)

Approximately 0.11 acres of shrubland thicket is present bisecting the perennial stream channel upstream of the existing bridge. This habitat is characterized by a dominant thicket of mature mulefat (*Baccharis salicifolia*), a shrub typically associated with riparian banks and other moist areas. The thicket is dense and monocultural, containing almost no other species aside from intermittent saplings of arroyo willow (*Salix lasiolepis*). This community type was not present in the BSA in earlier surveys and has since formed through sediment deposition in the previous channel and now only supports flow during severe storm events. This habitat was identified as an in-stream wetland on the July 2025 site visit and has been incorporated into the supplemental delineation.

Seasonal Wetland
A portion of a seasonal wetland (approximately 0.01 acres) is present in the very southern portion of the BSA, as shown on Figure 4.4-1. The feature is located at the base of a small slope and extends south, outside of the southern boundary of the BSA. Vegetation in this area is dominated by Italian rye grass (*Festuca perennis*). No indicators of hydrology were observed;

however, the feature is located in a topographic position which likely collects water and exhibits hydrophytic vegetation and hydric soils; as such, hydrology is presumed present but not observed due to time of year when the formal delineation was conducted. The boundary of the feature was delineated using shift in vegetation and topography.

Mixed Oak Woodland (*Quercus* Forest & Woodland Alliance)
Approximately 1.20 acres of mixed oak woodland community occurs immediately to the west of the wild oat grassland community on the most southwestern edge of the BSA. The canopy is composed of a mixture of valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and blue oak (*Quercus douglasiil*) with scattered California bay (*Umbellularia californica*). The understory is composed of mainly non-native shrubs such as vinca (*Vinca major*) and Himalayan blackberry (*Rubus armeniacus*). This community is considered sensitive in Sonoma County under the California Oak Woodlands Conservation Act.

California Bay Riparian Woodland (*Umbellularia californica* Forest & Woodland Alliance)
Approximately 0.11 acres of California bay riparian woodland community occurs along the southeastern edge of Maacama Creek within the BSA. In this area of the BSA, the creek bank is a steep rock face. The overstory of this community is composed of California bay trees with an understory of common snowberry (*Symphoricarpos albus var. laevigatus*) and California wild grape (*Vitis californica*). This biological community is listed as sensitive on the California Natural Community List (CDFW 2021b).

Valley Oak Woodland (*Quercus lobata* Woodland Alliance)
Approximately 0.94 acres of valley oak woodland community occurs along the western border of Chalk Hill Road, beginning at the southern edge of the existing bridge and extending southward until the landscaped area of the closest residence, excluding the area of coyote brush. The dominant canopy cover in this community is valley oak with some scattered *Salix sp.* (willows of various species). The understory is dominated by *Toxicodendron diversilobum* (poison oak). This biological community is listed as sensitive on the California Natural Community List (CDFW 2021b).

Valley Oak-Oregon Ash Woodland (*Quercus lobata* Riparian Alliance)
Approximately 0.39 acres of Valley oak-Oregon ash woodland community occurs along the northwestern edge of Maacama Creek within the BSA. Valley oak and Oregon ash are equally dominant in the canopy of this community. Himalayan blackberry and California wild grape are the dominant understory cover. This biological community is listed as sensitive on the California Natural Community List (CDFW 2021b).

Purple Needlegrass Grassland (*Stipa pulchra* Grassland Association)
Approximately 0.26 acres of *Stipa pulchra* (purple needlegrass grassland) occurs in several patches in the upland field southwest of the bridge within the BSA. Purple needlegrass is dominant in the herbaceous layer and *Danthonia californica* (California oatgrass) is characteristically present. Associated species include *Bromus hordeaceus* (soft chess brome), Italian ryegrass and *Brodiaea elegans* (elegant brodiaea). This biological community is listed as sensitive on the California Natural Community List (CDFW 2021b).

Non-Sensitive Communities

Ruderal/Disturbed and Developed
The ruderal/disturbed and developed portions of the BSA include the paved areas of Chalk Hill Road and Young Road that run through the BSA, including the existing bridge footprint. This community also includes all areas with residential structures (homes and outbuildings),

associated landscaping, and gravel and dirt roadsides. Vegetation in this community predominately consists of non-native species commonly found in the region, such as *Carduus pycnocephalus ssp. pycnocephalus* (Italian thistle), *Foeniculum vulgare* (fennel), and non-native grasses. Ruderal/disturbed and developed areas make up approximately 4.34 acres of the BSA.

Wild Oats Grassland (*Avena spp.* Herbaceous Semi-Natural Alliance)
Approximately 3.44 acres of *Avena barbata* (wild oat) grassland community occurs in the portion of the BSA that is proposed to be utilized as the staging area for the bridge construction and road approach work. This area is composed of a vacant lot on the western side of Chalk Hill Road in the southwestern portion of the BSA. Vegetation in this community is dominated by non-native annual grasses such as wild oat and Italian rye grass with interspersed native grasses such as purple needlegrass and *Chlorogalum pomeridianum* (amole) at much lower densities. A few scattered oak trees are found throughout this community.

Himalayan Blackberry Scrub (*Rubus armeniacus* Shrubland Semi-Natural Alliance)
Approximately 0.07 acres of Himalayan blackberry community occurs along the northern bank of Maacama Creek in the BSA, mainly underneath the existing Chalk Hill Road Bridge. The upland area is overgrown with mainly Himalayan blackberry and other scattered shrubs such as vinca and California wild grape.

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)
Approximately 0.23 acres of *Baccharis pilularis* (coyote brush) scrub community occurs between *Salix lasiolepis* (arroyo willow) and valley oak upland woodland communities. The area is dominated by mainly coyote brush with scattered *Conium maculatum* (poison hemlock). The understory is composed of a variety of non-native annual grasses similar to those found in the wild oat grassland community described above.

Coast Live Oak Woodland (*Quercus agrifolia* Forest & Woodland Alliance)
Approximately 0.71 acres of coast live oak woodland community occurs along the eastern edge of Chalk Hill Road just south of the residence at the intersection of Young Road and Chalk Hill Road. The canopy is dominated by coast live oak with some other oaks, such as valley oak, scattered throughout. There was evidence of fire activity in this community in the recent past during the September 14, 2021, site visit. An understory had not fully developed.

Knobcone Pine Forest (*Pinus attenuata* Forest & Woodland Alliance)
Approximately 0.43 acres of *Pinus attenuate* (knobcone pine) forest community occurs along the eastern border of the BSA, south of the residence that is adjacent to the intersection of Young Road and Chalk Hill Road. Due to the proximity of this community to private property, the area was not directly surveyed during the site visits. From a distance it is apparent that the canopy is dominated by knobcone pine with sparse understory.

Arroyo Willow Thicket (*Salix lasiolepis* Shrubland Alliance)
Approximately 0.77 acres of arroyo willow thicket community occurs within the creek bed of Maacama Creek and along the northern banks where the slope is more gradual toward the top of bank. The soil substrate transitions from gravel to finer grained soil, allowing for the establishment of vegetation along the riparian corridor. The community is dominated by arroyo willow shrubs with a dense understory of mostly Himalayan blackberry. This biological community as a vegetation alliance is not listed as sensitive on the California Natural Community List, due to the understory of non-native vegetation (CDFW 2021b).

Special-Status Plant and Wildlife Species

Special-status species with potential to occur within the BSA were first evaluated through a literature and database review as described above. Based on the search results of CDFW (2021a), CNPS (2021), and USFWS (2021), it was determined that 104 special-status plant species and 28 special-status wildlife species have been documented from or have a range that occurs in the Healdsburg, Jimtown, Mt. Saint Helena, Mark West Springs, Santa Rosa, Sebastopol, Camp Meeker, Guerneville, or Geyserville 7.5-minute U.S. Geological Survey (USGS) quadrangles. Of these species, 15 special-status plant species and 13 special-status wildlife species have been documented within five miles of the BSA (CDFW 2021a). Following the database and literature review, the potential for special-status species to occur within the BSA was determined based on the conditions observed during the field surveys.

Special-status Plants

For the purpose of this evaluation, special-status plant species include plants that are (1) listed or proposed for listing as threatened or endangered under the ESA; (2) listed or candidates for listing as threatened or endangered under CESA; (3) designated as rare by under the California Native Plant Protection Act; and/or (4) have a California Rare Plant Rank (Rank) of 1A, 1B, 2A, or 2B, or considered locally significant plants, that is, plants that are not rare from a statewide perspective, but that are rare or uncommon locally or regionally, or designated in a local or regional plan, policy or ordinance.

Based on results of the CNDDB, CNPS, and USFWS database searches, a total of 104 special-status plant species may occur in the general vicinity of the BSA. Of these, 89 species were determined to have no potential to occur within the BSA due to one or more of the following:

- Hydrologic, edaphic (soil), topographic, and pH conditions necessary to support the special-status plant species are not present in the BSA;
- Associated natural communities necessary to support the special-status plant species are not present in the BSA;
- The BSA is geographically isolated from the documented range of the special-status plant species;
- The historical landscape or habitat(s) of the BSA were not suitable habitat prior to land conversion to support the special-status plant species;
- Land use history and contemporary management (e.g., grading, mowing) has degraded the localized habitat necessary to support the special-status plant species.

Nine special-status species were determined to have the potential to occur within the BSA, including:

- Napa false indigo (*Amorpha californica var. napensis*, Rank 1B.2)
- Bent-flowered fiddleneck (*Amsinckia lunaris,* Rank 1B.2)
- Pappose tarplant (*Centromadia parryi* ssp. *parryi,* Rank 1B.2)
- Congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*, Rank 1B.2)
- Thin-lobed horkelia (*Horkelia tenuiloba,* Rank 1B.2)
- Jepson's leptosiphon (*Leptosiphon jepsonii*, Rank 1B.2)
- Marsh microseric (*Microseris paludosa,* Rank 1B.2)
- Two-fork clover (*Trifolium amoenum,* federally endangered, Rank 1B.1)
- Oval-leaved viburnum (*Viburnum ellipticum,* Rank 2B.3)

Targeted rare plant surveys were conducted on April 15, May 16, and June 5, 2022. No special-status plants were observed during the rare plant surveys. Therefore, the nine species with potential to occur within the BSA are presumed absent from the project site.

Special-status Wildlife

For the purpose of this evaluation, special-status animal species include species that are (1) listed as threatened or endangered under the CESA or the ESA; (2) proposed for federal listing as threatened or endangered; (3) state candidates for listing as threatened or endangered; and/or (4) identified by CDFW as Species of Special Concern (SSC) or California Fully Protected Species.

Results of the CNDDB and USFWS database searches indicated 27 special-status wildlife species may occur in the general vicinity of the BSA. Thirteen of these species have been documented in CNDDB within five miles of the BSA (CDFW 2021), and a total of eight species have a moderate or high potential to occur based upon habitat conditions present in the BSA and documented ranges.

Eight species were determined to have the potential to occur within the BSA, including:

- Western pond turtle (*Emys marmorata*)
- Foothill yellow-legged frog (*Rana boylii*)
- Russian River tule perch (*Hysterocarpus traskii pomo*)
- California giant salamander (*Dicamptodon ensatus*)
- Red-bellied newt (*Taricha rivaularis*)
- CC Chinook salmon, evolutionary significant unit (ESU) (*Oncorhynchus tshawytscha*)
- CCC Coho salmon, ESU (*Oncorhynchus kisutch*)
- CCC Steelhead, distinct population segment (DPS) *Oncorhynchus mykiss*)

Species with potential to occur within the BSA are described in further detail below. The remaining 19 special-status wildlife species documented in the vicinity are unlikely to occur in the BSA due to existing conditions within and surrounding the BSA. Roadways, residential development, and various anthropogenic disturbances greatly reduce the amount of available breeding, rearing, and foraging habitat for most special-status species. Several habitat types or habitat conditions that are required to support special-status wildlife species are also absent from the BSA, such as marsh, old growth forests, caves, and coastal habitats. No special-status wildlife species were observed within the BSA during the field surveys.

California giant salamander (*Dicamptodon ensatus)*, CDFW Species of Special Concern
The California giant salamander is endemic to the north-central California Coast Ranges and occurs in two discrete areas north and south of San Francisco Bay. This species primarily occupies moist coniferous and mixed forests but is also found along streams in coastal woodland and chaparral areas. Discoveries of this species at burrows are restricted to wet, shaded along streams, stream banks, and moist road cuts, and only above ground during fall and winter rain events (Fellers et al 2010, Thomson et al 2016). Breeding occurs in cold, permanent or semi-permanent streams, often in headwater reaches. There are multiple occurrences of this species upstream of the BSA within the Maacama Creek watershed and the species has a moderate to high potential to occur.

Northwestern pond turtle (*Actinemys marmorata)* Federal Proposed Threatened, CDFW Species of Special Concern
The Northwestern pond turtle (NPT) is the only native freshwater turtle in California. This turtle is found in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and

Transverse Ranges. NPT inhabits annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 feet in elevation, as well as man-made habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks, and sand. Warm, shallow, nutrient-rich waters are ideal as they support prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. To escape periods of high water flow, high salinity, or prolonged dry conditions, NPT may move upstream and/or take refuge in vegetated, upland habitat for up to four months (Rathbun et al. 2002). Although upland habitat is utilized for refuging and nesting, this species preferentially utilizes aquatic and riparian corridors for movement and dispersal.

NPT nests from late April through July. This species requires open, dry upland habitat with friable soils for nesting and prefer to nest on unshaded slopes within 15 to 330 feet of suitable aquatic habitat (Rathbun et al. 1992). Females venture from water for several hours in the late afternoon or evening during the nesting season to excavate a nest, lay eggs, and bury the eggs to incubate and protect them. Nests are well-concealed, though native mammals are occasionally able to locate and predate upon eggs. Hatchlings generally emerge in late fall but may overwinter in the nest and emerge in early spring of the following year. There are documented occurrences of this species within the Maacama Creek watershed. This species is unlikely to nest within the BSA; however, the creek contains open banks suitable for basking, and this species has a moderate to high potential to reside in the BSA.

Foothill yellow-legged frog (*Rana boylii)* North Coast Distinct Population Segment (Pop. 1) CDFW Species of Special Concern
The Foothill yellow-legged frog (FYLF) historically occurred in coastal and mountain streams from southern Oregon to Los Angeles County but has declined in many parts of this range. This species is strongly associated with rivers and creeks, and prefers shallow, flowing water with a rocky substrate. Individuals do not typically move overland and are rarely observed far from a source of permanent water. In northern California, it was observed adults were on average within ten feet and rarely over 40 feet from the stream (Bourque 2008). Aquatic breeding sites are often near stream confluences, with egg masses typically deposited behind or sometimes under rocks in low-flow areas with cobble and/or gravel (Thomson et al. 2016). There are documented occurrences of this species within the Maacama Creek watershed. The creek substrate is of suitable size for egg-laying and during a typical water year, flow would be adequate to support this species, therefore this species has a moderate to high potential to occur within the BSA.

Red-bellied newt (*Taricha rivularis)*, CDFW Species of Special Concern
The red-bellied newt is endemic to the California Coast Ranges from southern Sonoma County through central Humboldt County. Cool coastal forests (typically coniferous) provide typical habitat, though this species also occupies hardwood forests. Similar to other newts, adults are primarily terrestrial but shift annually between terrestrial and aquatic (breeding) phases. Breeding occurs during the spring in mountain streams, usually with moderate to high flow and rocky substrates; ponds are only rarely used (Thomson et al. 2016). There are occurrences of this species within the Maacama Creek watershed upstream of the BSA. This species could easily disperse within the BSA and therefore has a moderate to high potential to occur within the BSA.

Russian River tule perch (*Hysterocarpus traskii pomo*), CDFW Species of Special Concern

Russian River tule perch is a subspecies of Tule Perch (*Hysterocarpus traskii*) which occurs only in the Russian River and its lower tributaries. Tule perch are the only freshwater surfperch and are native to rivers and estuaries of central California. Tule perch are small (up to 15 cm) with a definite hump shape between the head and dorsal fin. Their color varies, with bluish or purplish cast backs, a whitish or yellowish belly, and a barred pattern on the sides. They inhabit lowland lakes, sloughs, streams, and rivers, generally in areas with beds of vegetation or overhangs. The BSA contains deep, covered pools where this species could reside. Additionally, the BSA is a tributary of the Russian River, and this species has been documented within Maacama Creek just downstream of the BSA (CDFW 2021). This species has a moderate to high potential to occur within the BSA.

Chinook salmon - CC ESU (*Oncorhynchus tshawytscha*), Federal Threatened,
The CC Chinook salmon includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River to the Russian River. CC Chinook salmon typically return to their natal rivers in the fall after two to three years at sea, and juveniles emerge in late winter or spring. This species has been documented in Maacama Creek during recent salmonid surveys within the area (Sonoma RCD 2015) and therefore has a moderate to high potential to occur within the BSA.

Coho salmon - CCC ESU (*Oncorhynchus kisutch)*, Federal Endangered, State Endangered
The CCC coho salmon includes all naturally spawned populations of coho salmon in California streams from the Eel River to Aptos Creek, including the Russian River and its tributaries, excluding the Sacramento-San Joaquin River Basin. CCC Coho salmon typically migrate in late fall to early winter to spawn in smaller coastal streams. Spawning migration known as “runs” occur throughout the year. Spawning occurs mainly between November and January but can also occur as late as March during drought conditions. Juveniles may spend several years in the freshwater habitat before migrating to the ocean. Most adult fish return “home” maintaining fidelity to their natal stream. Preferred spawning habitat for CCC coho salmon is small freshwater streams with cool to cold water temperature, medium to small gravel substrate, and high dissolved oxygen levels at the head of a riffle where water changes from laminar flow to turbulent flow (providing greater dissolved oxygen). Abundant riffle areas (shallow areas with gravel substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. Maacama Creek is designated as critical habitat for this species. This species has not been documented in the creek during recent surveys; however, it has been documented in Redwood Creek which enters Maacama Creek upstream of the BSA (California Sea Grant 2021). Therefore, there is a moderate to high potential for this species to occur within the BSA.

Steelhead - CCC DPS (*Oncorhynchus mykiss irideus)*, Federal Threatened
The CCC steelhead includes all naturally spawned populations of steelhead in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin. Steelhead typically migrate to marine waters after spending two years in freshwater, though they may stay up to seven. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4-or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels and fast flowing water. Abundant riffle areas (shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. The Maacama Creek is designated as critical

habitat for the CCC steelhead. This species has been documented in the creek during salmonid surveys within the area (California Sea Grant 2021, CDFG 1998), and therefore has a moderate to high potential to occur within the BSA.

Nesting Birds and Roosting Bats

Although no special-status bird species are likely to occur within the BSA, most native birds in the United States, including non-status species, are protected by the Federal Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC). Under this legislation, destroying active nests, eggs, or young is illegal. Vegetation within and surrounding the BSA may provide potential nest sites or foraging habitat for bird species covered under the MBTA and CFGC. During each site visit, cliff swallow (*Petrochelidon pyrrhonota*) nests were observed on the bridge structure. Other birds could utilize the trees throughout the BSA as well as the emergent vegetation within the creek for nesting.

While there are cracks in the bridge abutment structures that could be utilized by special-status bat species, the frequent traffic along the bridge would preclude any establishment of roosting colonies. Additionally, no evidence of bat occupation was observed during the September 14, 2021 site visit. Bats occupying the BSA would likely be limited to utilizing the trees surrounding the riparian area.

Critical Habitat and Wildlife Movement Corridors

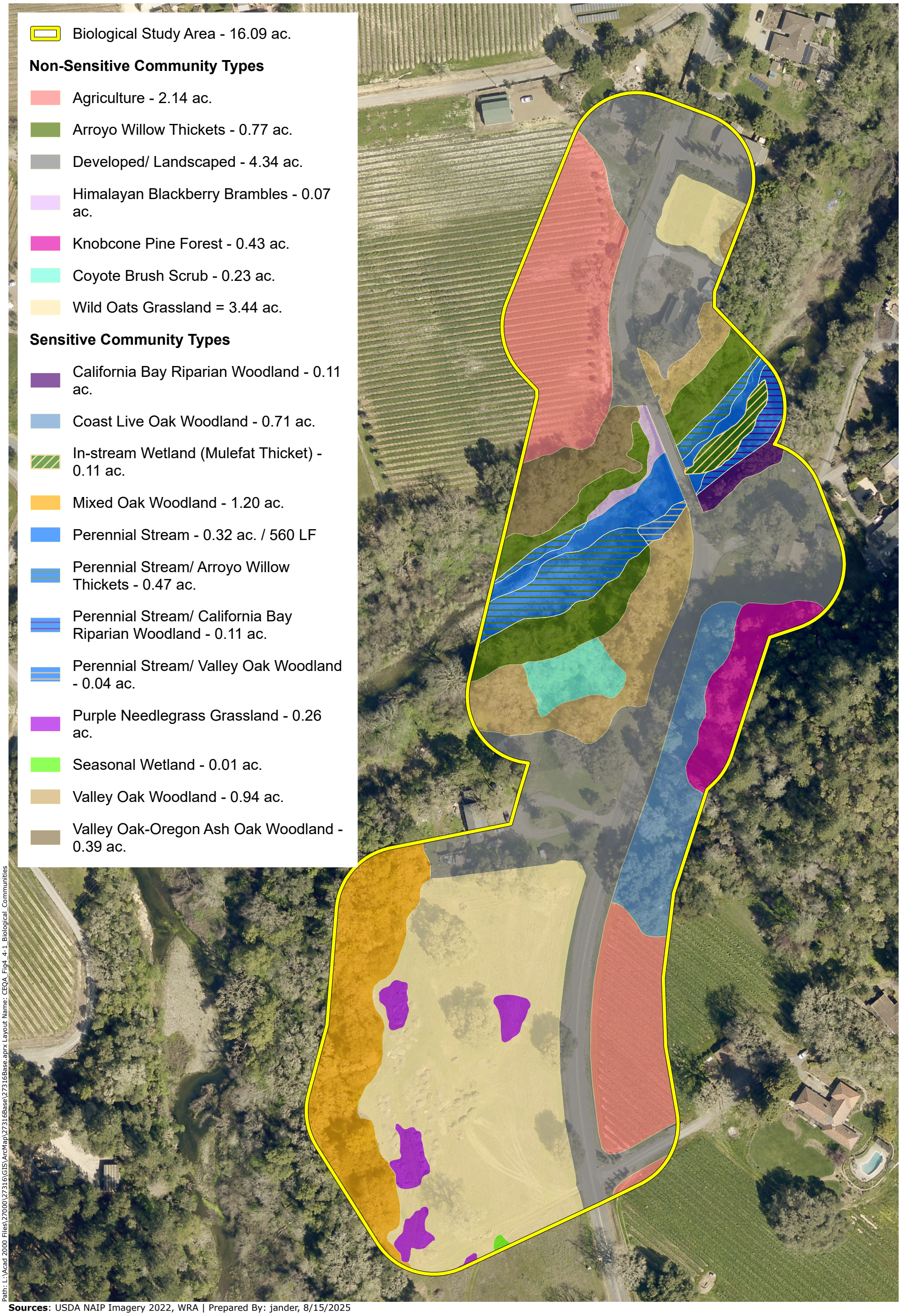
Maacama Creek is designated as critical habitat for both CCC coho salmon and CCC steelhead. Both species, and CC Chinook salmon, have the potential to occur in the BSA during typical water year conditions. Additionally, Maacama Creek contains designated Essential Fish Habitat for the Pacific Coast Salmon Fishery Management Plan (FMP). There are no barriers to fish passage downstream of the BSA that would prevent these species from migrating upstream to the area.

Critical habitat within the BSA includes riparian woodland forest and intermittent stream habitats, including pools that may be present dependent on flow and groundwater conditions. Existing riparian vegetation on both banks and within the channel supports water quality and seasonal rearing habitat for juveniles when flow is present. The BSA provides migratory and seasonal rearing habitat for salmonids, but no spawning habitat is known to be present. Historical surveys of Maacama Creek indicate a declining trend in habitat quality, including stream flows, from 1965 through 1996. A 1996 stream survey of the Maacama Creek mainstem (California Department of Fish and Game [CDFG] 1998) found poor and degraded habitat conditions, inadequate riparian canopy, warm water, and siltation, whereas in 1965 and 1973, CDFG surveys found consistently good quality habitat and cool water temperatures. Sedimentation in the watershed appeared to be increasing, while summer flows were decreasing during this period (Sonoma RCD 2015, California Sea Grant 2021).

Jurisdictional Waters and Wetlands

A delineation of aquatic resources that are potential waters of the U.S. and waters of the state was conducted by WRA in November 2022 and was updated and revised delineation following follow-up site visits in August 2025. Potentially jurisdictional waters and wetlands in the BSA include Maacama Creek and associated in-stream wetland and riparian areas, in additional to a seasonal wetland in the very southern portion of the BSA. These features are potentially subject to USACE, RWQCB, and CDFW oversight. There are potentially a total of 1.09 acres of waters of

the U.S./state and 0.01 acres of seasonal wetland. Jurisdictional areas will be verified with the USACE, RWQCB, and CDFW during the regulatory permitting process.



Sources: USDA NAIP Imagery 2022, WRA | Prepared By: jander, 8/15/2025

Figure 4.4-1 Biological Communities within the Biological Study Area

Chalk Hill Road Bridge Replacement

Sonoma County, California

0 200 400 Feet

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wra Environmental Consultants

4.4.3 Regulatory Setting

FEDERAL REGULATIONS

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 provides a framework which federal agencies must follow in evaluating environmental impacts of their actions. Actions by federal agencies must "use all practicable means and measures" to avoid or lessen impacts to the environment. In 2007, formal guidance for the continuation of a pilot program was issued which allows Caltrans to assume all of the Federal Highway Administration (FHWA) environmental responsibilities under NEPA and other environmental laws (NEPA Delegation). This delegation authority is limited to highway projects, including Local Assistance Federal Aid projects, and specific projects within the State or a programmatic delegation. Therefore, Caltrans must ensure joint projects with FHWA or projects funded with Federal Aid are in compliance with NEPA.

Federal Endangered Species Act

The Endangered Species Act (ESA) identifies, protects, and provides for the recovery of threatened or endangered species under the Secretary of Interior and the Secretary of Commerce. The United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) are responsible for implementing and enforcing the ESA (16 USC Section 1531). USFWS has authority over terrestrial and continental aquatic species, and NMFS has authority over species that spend all or part of their life cycle at sea.

Section 9 of ESA prohibits the unlawful "take" of any listed fish or wildlife species. ESA defines "take" as a means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such action." USFWS's regulations define harm as "an act which actually kills or injures wildlife." This act "may include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR § 17.3). Take can be permitted under ESA pursuant to sections 7 and 10.

Section 7 provides a process for take permits for federal projects or projects subject to a federal permit, requiring interagency consultation if there is a federal nexus. The Section 7 consultation process, which applies to both listed animal and/or plant species, is designed to ensure that the federal agency action does not jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat. Section 10 provides a process for incidental take permits for projects proposed by private individuals, requiring the submittal of a Habitat Conservation Plan (HCP). A Habitat Conservation Plan prepared under Section 10 outlines conservation measures to minimize the impacts of incidental take to listed species, including measures to maintain, enhance and protect the species' habitat.

The ESA does not extend the take prohibition to federally listed plants on private land, other than prohibiting the removal, damage, or destruction of such species in violation of state law.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the

purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) was established in the U.S. in 1918 and is enforced by the USFWS. The MBTA (16 USC §§ 703 et seq., Title 50 Code of Federal Regulations [CFR] Part 10) states that it is "unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill; attempt to take, capture or kill; possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or in part, of any such bird or any part, nest or egg thereof..." Under MBTA, it is illegal to disturb a nest that is in active use, since this could result in killing a bird, destroying a nest, or destroying an egg. The MBTA does not protect bird species that are non-native or human-introduced or that belong to families that are not covered by any of the conventions implemented by MBTA.

Clean Water Act

The Clean Water Act (CWA) is the primary federal law regulating water quality under the U.S. Environmental Protection Agency (EPA). However, the U.S. EPA depends on other agencies, such as the individual states and the USACE, to assist in implementing the CWA. The objective of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 and 401 of the CWA apply to activities that would impact waters of the U.S. The USACE enforces Section 404 of the CWA and the California State Water Resource Control Board enforces Section 401.

Under Section 404 of the CWA, the EPA regulates the discharge of dredged or fill material into "waters of the U.S." "Waters of the U.S" include territorial seas, tidal waters, and non-tidal waters in addition to wetlands and drainages that support wetland vegetation, exhibit ponding or scouring, show obvious signs of channeling, or have discernible banks and high-water marks. Wetlands are defined as those areas that are "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3(b)). The discharge of dredged or fill material into waters of the U.S. is prohibited under the CWA except when it is in compliance with Section 404 of the CWA. Substantial impacts to waters of the U.S. may require an Individual Permit. Projects that only minimally affect waters of the U.S. may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions.

Any applicant for a federal permit to impact waters of the U.S. under Section 404 of the CWA, including Nationwide Permits where a pre-construction notification is required, must also provide a Water Quality Certification or waiver, pursuant to Section 401 of the CWA, from the State of California to the USACE. The 401 Certification is provided by the State Water Resources Control Board through the local RWQCB. The RWQCB issues and enforces permits for discharge of treated water, landfills, storm-water runoff, filling of any surface waters or wetlands, dredging,

agricultural activities and wastewater recycling. The RWQCB recommends the 401 Certification application be made at the same time that any applications are provided to other agencies, such as the USACE, USFWS, or NMFS. The application is not final until completion of environmental review under CEQA. The application to the RWQCB is similar to the pre-construction notification that is required by the USACE. It must include a description of the habitat that is being impacted, a description of how the impact is proposed to be minimized and proposed mitigation measures with goals, schedules, and performance standards. Mitigation must include a replacement of functions and values, and replacement of wetland at a minimum ratio of 2:1, or twice as many acres of wetlands provided as are removed. The RWQCB looks for mitigation that is on site and in- kind, with functions and values as good as or better than the water-based habitat that is being removed.

Section 10 of Rivers and Harbors Act

The Rivers and Harbors Act requires permits in navigable waters of the U.S. for all structures such as riprap and activities such as dredging. The term navigable waters of the United States and all other terms relating to the geographic scope of jurisdiction are defined at 33 CFR part 329. Generally, they are those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high-water mark, and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. The USACE grants or denies permits based on the effects on navigation. Maacama Creek is a tributary to the Russian River, which is only considered navigable below Vacation Beach which is farther than 10 miles downstream of the site. Therefore, this creek is not considered a navigable water subject to the Rivers and Harbors Act.

Executive Order 11990 – Protection of Wetlands

This order established a national policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. The U.S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this directive. On federally funded projects, impacts to wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding. An additional requirement is to provide early public involvement in projects affecting wetlands. FHWA provides technical assistance (Technical Advisory 6640.8A) and reviews environmental documents for compliance.

STATE REGULATIONS

California Endangered Species Act

The California Endangered Species Act ([CESA] Fish and Game Code Section 2050 et. seq.) prohibits take and protects state-listed threatened and endangered species under the CDFW. The CDFW regulates activities that may result in “take” of a listed species (i.e., “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”). Habitat degradation or modification is not expressly included in the definition of “take” under the California Fish and Game Code (CFGC), but CDFW has interpreted “take” to include the killing of a member of a species that is the proximate result of habitat modification.

California Fish and Game Code

Sections 1600-1607 of the CFGC require that a Notification of Lake or Streambed Alteration Agreement (LSAA) application be submitted to the CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions in the application and, if necessary, prepares a LSAA that includes measures to protect affected fish and wildlife resources.

Nesting Birds

Nesting birds, including raptors, are protected under CFGC Section 3503, which reads, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." In addition, under CFGC Section 3503.5, "it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nestor eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Passerines and non-passerine land birds are further protected under CFGC 3513. CDFW typically recommends surveys for nesting birds that could potentially be directly (e.g., actual removal of trees/vegetation) or indirectly (e.g., noise disturbance) impacted by project-related activities. Disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFW.

Non-Game Mammals

Sections 4150-4155 of the CFGC protects non-game mammals, including bats. Section 4150 states "A mammal occurring naturally in California that is not a game mammal, fully protected mammal, or fur-bearing mammal is a non-game mammal. A non-game mammal may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission." The non-game mammals that may be taken or possessed are primarily those that cause crop or property damage. Bats are classified as a non-game mammal and are protected under the CFGC.

California Fully Protected Species and Species of Special Concern

The classification of "fully protected" was the CDFW's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or ESA. CFGC sections (fish at §5515, amphibians and reptiles at §5050, birds at §3503 and §3511, and mammals at §4150 and §4700) dealing with "fully protected" species state that these species "...may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species," although take may be authorized for necessary scientific research. This language makes the "fully protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003, the code sections dealing with "fully protected" species were amended to allow the CDFW to authorize take resulting from recovery activities for state-listed species.

California Species of Special Concern (SSC) are broadly defined as animals not listed under the ESA or CESA, but which are nonetheless of concern to the CDFW because they are declining at a rate that could result in listing or because they historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFW, land managers, consulting biologists, and others,

and is intended to focus attention on the species to help avert the need for costly listing under ESA and CESA and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given special consideration under the CEQA during project review.

California Porter-Cologne Water Quality Control Act

The intent of the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is to protect water quality and the beneficial uses of water, and it applies to both surface and ground water. Under this law, the State Water Resources Control Board (SWRCB) develops statewide water quality plans, and the RWQCBs develop basin plans that identify beneficial uses, water quality objectives, and implementation plans. The RWQCBs have the primary responsibility to implement the provisions of both statewide and basin plans. Waters regulated under the Porter-Cologne Act, referred to as "waters of the State," include isolated waters that are not regulated by the USACE. Projects that require a USACE permit, or fall under other federal jurisdiction, and have the potential to impact waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a federal license or permit, any person discharging, or proposing to discharge, waste (e.g., dirt) to waters of the State must file a Report of Waste Discharge and receive either waste discharge requirements or a waiver to waste discharge requirements before beginning the discharge.

Streams, Lakes, and Riparian Habitat in California

Streams and lakes, as habitat for fish and wildlife species, are subject to the jurisdiction of the CDFW under Sections 1600-1616 of the CFGC. Alterations to, or work within or adjacent to streambeds or lakes generally require a 1600 series LSAA. The term "stream," which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition, the term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). "Riparian" is defined as "on, or pertaining to, the banks of a stream." Riparian vegetation is defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CFGC § 2785). Removal of riparian vegetation also requires a LSAA from the CDFW.

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The Sonoma County General Plan OSRC Element designates Biotic Habitat Areas as known locations identified as special-status species habitat, marshes and wetlands, sensitive natural communities, and habitat connectivity corridors. The County implements objectives of the General Plan in Biotic Habitat Areas through the establishment of the Biotic Resources combining district. The OSRC Element contains various policies pertaining to the Biotic Resources combining district; however, the BSA is not located within this district, therefore these policies are not

applicable to the Project. The OSRC Element contains other policies related to the protection of biological resources, including the following which are relevant to the Project:

Policy OSRC-7k: Require the identification, preservation and protection of native trees and woodlands in the design of discretionary projects, and, to the maximum extent practicable, minimize the removal of native trees and fragmentation of woodlands, require any trees removed to be replaced, preferably on the site, and provide permanent protection of other existing woodlands where replacement planting does not provide adequate mitigation.

Policy OSRC-7l: Identify important oak woodlands, assess current protection, identify options to provide greater protection of oak woodlands and their role in connectivity, water quality and scenic resources, and develop recommendations for regulatory protection and voluntary programs to protect and enhance oak woodlands through education, technical assistance, easements and incentives.

Policy OSRC-7m: Designate important valley oak habitat areas, reevaluate current designations, and apply a Valley Oak Habitat combining district zoning that requires adequate mitigation for trees removed and monitoring of replacement tree survival.

Policy OSRC-8a: Classify "Riparian Corridors" designated in the Open Space and Resource Conservation Element as follows:

1. "Russian River Riparian Corridor" is the corridor adjacent to the main stem of the Russian River, excluding lands located within the Urban Residential, Commercial, Industrial, or Public-Quasi Public land use categories or within the jurisdiction of a city.
2. "Flatland Riparian Corridors" are the corridors adjacent to designated streams in the 1989 General Plan that flow through predominantly flat or very gently sloping land, generally with alluvial soil. This classification excludes areas located within the "Russian River Riparian Corridor" or within the Urban Residential, Commercial, Industrial, or Public/Quasi-Public land use categories.
3. "Other Riparian Corridors" are the corridors adjacent to all designated streams not included in 1. or 2. above.

Policy OSRC-8b: Establish streamside conservation areas along both sides of designated Riparian Corridors as follows, measured from the top of the higher bank on each side of the stream as determined by PRMD:

1. Russian River Riparian Corridor: 200'
2. Flatland Riparian Corridors: 100'
3. Other Riparian Corridors: 50'

Policy OSRC-8d: Allow or consider allowing the following uses within any streamside conservation area:

(1) Timber harvest operations conducted in accordance with an approved timber harvest plan.

(2) Streamside maintenance and restoration.

(3) Fire fuel management where vegetation removal is limited to the minimum required for fire safety purposes and where there are no feasible alternative development locations or designs that do not require vegetation removal.

(4) Road crossings, street crossings, utility line crossings.

(5) Mining operations conducted in accordance with the County Surface Mining and Reclamation Ordinance.

(6) Stream dams and stream-related water storage approved by applicable agencies.

(7) Grazing and similar agricultural production activities not involving structures or cultivation, except as defined by (8) below, and conducted in accordance with water quality protection guidelines of the Agricultural Commissioner, Resource Conservation Districts, or Regional Water Quality Control Boards.

(8) Agricultural cultivation and related planting, seeding, fertilizing, weeding, irrigation, and located harvesting.

a. Located no closer than 100' from the top of the bank in the "Russian River Riparian Corridor".

b. located no closer than 50' from the top of the bank in the "Flatland Riparian Corridors" or in upland areas of "Other Riparian Corridors".

c. located no closer than 25' from the top of the bank in the "Other Riparian Corridors" not in upland areas. The upland areas in (b) and (c) above shall be determined using information on streamside slopes from USGS topographic maps and soil types from the Soil Conservation Service "Soil Survey of Sonoma County".

(9) Equipment turnaround and access roads associated with agricultural cultivation, provided that the affected area is the minimum necessary for these turnaround and access roads and that a minimum 25' vegetative filter strip is provided and maintained between the affected area and the top of the bank.

(10) Vegetation removal as part of an integrated pest management program administered by the Agricultural Commissioner.

(11) Creekside bikeways, trails, and parks within Urban Residential, Commercial, Industrial, or Public-Quasi Public land use categories.

(12) Development authorized by exception under Policy OSRC-8e.*

Policy OSRC-8e: Prohibit, except as otherwise allowed by Policy OSRC-8d, grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots within any streamside conservation area. Consider an exception to this prohibition if:

(1) It makes a lot unbuildable and vegetation removal is minimized,

(2) The use involves the minor expansion of an existing structure where it is demonstrated that the expansion will be accomplished with minimum damage to riparian functions,

(3) The use involves only the maintenance or restoration of an existing structure or a non-structural use,

(4) It can clearly be demonstrated through photographs or other information that the affected area has no substantial value for riparian functions, or

(5) A conservation plan is approved that provides for the appropriate protection of the biotic resources, water quality, flood management, bank stability, groundwater recharge, and other applicable riparian functions. Until the County adopts mitigation standards and procedures for specific uses and riparian functions, prior to approving the conservation plan, consult on areas of concern with the Resource Conservation District, Agricultural Commissioner, and resource agencies that are applicable to the proposed plan.*

Sonoma County Code of Ordinances

The following discussion identifies local environmental regulations that serve to protect sensitive biological resources relevant to the CEQA review process from the Sonoma County Zoning Regulations (Chapter 26).

Riparian Corridor Combining Zone

Riparian corridors in Sonoma County are protected by Article 65, Riparian Corridor Combining Zone. This combining zone protects County-designated streams, including the bed, bank, and adjacent streamside conservation areas as measured from the top of bank or the outer drip line of the riparian trees. Specific setbacks are determined based on the affected river or stream and site-specific conditions but generally include a 25- to 200-foot setback.

Oak Woodland Combining District and Valley Oak Habitat Combining District

Article 67, Oak Woodland Combining District and Valley Oak Habitat Combining District, of the Sonoma County Zoning Code provides for protection and enhancement of oak trees and oak woodland habitats. Removal of oak trees in this zoning district requires mitigation measures including retention of other oaks, replacement plantings, and/or an in-lieu fee. While this portion of the zoning code is not applicable to County Public Works projects, it is used as a guide for determining impacts and appropriate mitigation measures.

4.4.4 Environmental Impact

APPROACH TO IMPACT ANALYSIS

The analysis presented in this section is based on literature/database reviews. Project impacts to plants and wildlife species are focused upon rare, threatened, and endangered species, as defined under CEQA Guidelines Section 15380.

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS);

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS;*

c) *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;*

d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or,*

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

Impacts on biological resources are evaluated based on the likelihood that special-status plant and animal species, special-status or sensitive natural communities, wildlife corridors, and other protected biological resources are present in the Project area (as discussed above in *Setting*), and the likely effects that construction, operation, and maintenance of the Project may have on these resources. Sensitive biological resources that are considered unlikely or have a low potential to occur within the Project area (see discussion above in *Setting*) are not considered in the impact analysis.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Special-status Plants

Based on a review of literature and resource databases and existing habitat conditions on-site, nine special-status plant species were determined to have the potential to occur within the Project site. Protocol-level rare plant surveys were conducted on April 15, May 16, and June 5, 2022 covering each of the blooming periods for each special-status plant species with potential to occur. No special-status plants were observed during the rare plant surveys. Therefore, the nine species with potential to occur within the BSA are presumed absent from the Project site. As such, the Project would have ***no impact*** on special-status plant species.

Special-status Wildlife

Based on a review of literature and resource databases and existing habitat conditions on-site, eight special-status wildlife species have the potential to occur within the BSA and therefore, could potentially be affected by the Project. Direct impacts could occur as a result of removal or disturbance of suitable habitat during construction which, in turn, could result in disturbance, injury, or mortality of individual animals. Indirect impacts, such as noise generated by construction activities and habitat disturbance, may also occur.

Species with potential to occur within the Project site include, California giant salamander, NPT, FYLF, red-bellied newt, Russian River tule perch, CC Chinook Salmon, CCC Coho salmon, and CCC steelhead. Potential impacts to these species are discussed in further detail below.

Mammals

The BSA contains potential habitat for roosting bats. Demolition of the existing bridge and tree trimming and removal associated with the proposed Project could result in the direct removal of active bat roosts protected under the CFGC and CEQA, which is a potentially significant impact. Therefore, Mitigation Measure BIO-1 shall be implemented, which requires tree trimming or removal to be conducted outside of the bat maternity season (generally April through October). If this work window is not feasible, bat roosts assessments shall be performed by a qualified biologist no more than 30 days prior to tree removal to determine if bat roosts are present. If special-status species or maternity roosts are detected, additional measures, including avoidance of the roost sites until the end of maternity roosting season, shall be recommended by the qualified biologist. In addition, all felled trees shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any bats present within the tree to vacate. With implementation of this measure, the impact of the Project would be ***less than significant with mitigation incorporated.***

Nesting Birds

The BSA contains potential nesting habitat for special-status and non-special-status nesting birds. Construction activities could result in direct impacts to active nests, loss of nesting habitat, and construction noise could result in temporary indirect impacts to active nests. 42 trees would be removed as part of the Project, which would result in a loss of nesting habitat. However, all trees removed for the Project would be replaced in kind with native tree species; therefore, no permanent impact to nesting habitat would occur. Additional trees may be trimmed to allow for construction of an access ramp to the creek bed. Direct or indirect impacts to nesting birds due to tree removal is a potentially significant impact.

Mitigation Measure BIO-2 would be implemented, which requires pre-construction surveys for nesting birds within the Project site. If active nests are identified, a no-work buffer shall be established around the nest until a qualified biologist has determined that the nest is no longer active. Implementation of this measure would ensure that the Project would not have a substantial adverse effect on nesting birds. The impact would be ***less than significant with mitigation incorporated***.

Amphibians and Reptiles

The California giant salamander, NPT, FYLF, and red-bellied newt have the potential to occur within the perennial stream, Arroyo willow thickets, Himalayan blackberry brambles, and mixed oak woodland habitats within the BSA. Temporary impacts to the perennial stream would occur during temporary stream diversion and erecting false work to support the new bridge during the construction phase. Permanent impacts to the stream would occur from the installation of permanent scour protection. These temporary and permanent impacts to Maacama Creek could directly or indirectly impact special-status reptiles and amphibians, which is a potentially significant impact.

To avoid and reduce impacts to the California giant salamander, NPT, FYLF, and red-bellied newt, Mitigation Measures BIO-3a, BIO-3b, BIO-3c, and BIO-4 would be implemented. Mitigation Measure BIO-3a requires that all work within 100 feet of the stream be scheduled to occur outside of the FYLF breeding season from March 1 to June 30, and that no work shall occur

within 48 hours after a precipitation event. Mitigation Measure BIO-3b requires pre-construction surveys to be conducted within 48 hours prior to the start of construction work to determine if the site has potential to support special-status amphibians at the time of construction. Mitigation Measure BIO-3c requires that a worker environmental awareness training program focused on special-status amphibians be given by a qualified biologist to the construction crew prior to the commencement of construction activities on theProject site. Mitigation Measure BIO-4 requires pre-construction surveys for NPT and prescribes follow-on steps if NPT is determined present.

The implementation of Mitigation Measures BIO-3a, BIO-3b, BIO-3c, and BIO-4 would ensure that the Project would not have any substantial adverse effects on the California giant salamander, NPT, FYLF, or red-bellied newt. The impact to special-status reptiles and amphibians would be ***less than significant with mitigation incorporated***.

Fish

The Russian River tule perch, CC Chinook salmon, CCC coho salmon, and CCC steelhead have the potential to occur within portions of Maacama Creek within the BSA. The creek is designated critical habitat for the CCC steelhead and CCC Coho salmon and is designated Essential Fish Habitat for Pacific Coast salmon. The Project would result in temporary and permanent impacts to special-status fish and their habitat, which is a potentially significant impact. Temporary impacts would occur during temporary stream diversion, grading, fish capture and relocation (if needed), and erecting false work to support the new bridge during the construction phase. Permanent impacts to the stream would occur from the installation of permanent scour protection and shading of riparian vegetation from the new bridge.

If Maacama Creek has perennial flow at the time of construction, the proposed Project would result in a temporary loss of habitat for all of the special-status fish species discussed above and would result in a permanent alteration to critical habitat for CCC steelhead and CCC coho salmon. Mitigation Measure BIO-5 would be implemented, which requires that, if suitable rearing habitat in the form of streamflow in the channel or pools with suitable conditions are present at the time of construction, a fish relocation plan would be implemented to avoid and minimize potential impacts to special-status fish. The fish capture and relocation plan would be subject to NMFS approval. The plan would be implemented to move fish and other aquatic life in the Project site to a suitable location outside of the site if streamflow and/or pools are present in the BSA during construction, and if work would potentially affect aquatic species. Implementation of the fish capture and relocation plan, as described in Mitigation Measure BIO-5 would ensure fish are not harmed by stream dewatering, and implementation of the stream diversion system described in *Section 2.0, Project Description*, would allow any fish moving through the stream to safely pass through the BSA during construction. All construction work within the channel would be conducted during the dry season (June 15 to October 15) to avoid disrupting the adult migration cycle.

ESA Section 7 consultation with NMFS was conducted and a Biological Opinion was issued by NMFS in June 2023. The NMFS concluded that the proposed Project would not jeopardize the continued existence of CCC coho salmon, CCC steelhead, or CC Chinook salmon. The NMFS also concluded that the Project would not result in the destruction or adverse modification of designated critical habitat for these species. However, as “take” of CCC coho and CCC steelhead is reasonably certain to occur, an incidental take statement with terms and conditions was issued. The Project is required to implement the terms and conditions listed in the final permits, which will be included as a condition of approval for the Project. Terms and conditions include

retaining a qualified biologist to conduct fish collections and oversee certain construction activities, such as the placement and removal of cofferdams and channel diversions, and dewatering activities. With implementation of these measures, the NMFS has determined that the extent of "take" expected to result from the Project would not jeopardize the species or result in destruction or adverse modification of critical habitat.

Proposed Project construction would also result in temporary and permanent impacts to designated critical habitat for steelhead and coho salmon, and habitat for Chinook salmon and Russian River tule perch; however, no permanent adverse impacts are anticipated. All construction within the creek bed is scheduled when special-status fish species are least likely to be present or passing through the Project site. Construction of the new bridge would involve work within the creek, but the materials added to the creek bed would be removed upon completion of the new bridge. The stream channel and banks would be restored to near pre-Project conditions following the completion of bridge work, recreating the gradient which currently exists. South creek bank stabilization and restoration would use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. Permanent impacts to designated critical habitat would result from the implementation of the scour countermeasures. The countermeasures include the installation of vegetated rock slope protection and log rootwads along the southern banks of Maacama Creek that has been severely eroded from high flows in recent years. The installation of slope protection would limit riparian growth in the short-term, and to some extent over the long-term. However, willow stakes and other native riparian vegetation will be interspersed with the rock material, and these plantings are expected to improve riparian cover as they mature. In addition, the log rootwads are designed to provide flow refugia for migrating and rearing salmonids and complex rearing habitat that juveniles utilize for cover. In more typical water years, log rootwads create scour pools that can persist into the dry months, providing additional habitat for oversummering juveniles. These habitat benefits would enhance the value of salmonid habitat in the BSA, which is a long-term beneficial impact of the Project.

Permanent impacts to salmonid habitat would also result from shading of riparian vegetation from construction of the new bridge. However, with demolition and removal of the existing bridge, establishment and growth of new riparian vegetation is expected, offsetting the impacts. Therefore, the Project would not have a substantial adverse effect on habitat for Russian River tule perch, CCC coho salmon, CCC steelhead, or CC Chinook salmon because the long-term impact of the Project would enhance the fish habitat within the BSA.

With the implementation of Mitigation Measure BIO-5 and compliance with the terms and conditions stipulated in the NMFS Biological Opinion, the Project would not have any substantial adverse effects on Russian River tule perch, CC Chinook salmon, CCC Coho salmon, CCC steelhead, and essential fish habitat. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure BIO-1: Day Roosting Bats

To the extent feasible, any tree removal or trimming shall be conducted outside of the bat maternity season (generally April through October). If this work window is not feasible, preconstruction bat roost assessments shall be conducted by a qualified biologist at least 14 days and no more than 30 days prior to removal of trees or vegetation. If special-status bat species or maternity roosts are detected during these surveys, additional measures including

avoidance of the roost sites until the end of the maternity roosting season shall be recommended by the qualified biologist. Regardless of the timing of tree removal or trimming activities, all felled trees or large limbs shall remain on the ground for at least 24 hours prior to chipping, off-site removal, or other processing to allow any roosting individual bats to vacate the premises of their own volition.

Mitigation Measure BIO-2: Pre-construction Nesting Bird Surveys

If construction activities for the Project begin between February 1 and August 31, pre-construction surveys within the Project site shall be conducted by a qualified biologist prior to vegetation or tree removal and to determine whether active nests containing eggs, chicks, or young are present. Pre-construction surveys for active nests will be conducted no more than 14 days prior to initial ground- or vegetation-disturbing activities. If active nests containing eggs, chicks, or young are not observed during pre-construction surveys, construction can proceed with no further mitigation measures.

If active nests containing eggs, chicks, or young are observed, ground-disturbing activities shall be avoided within a 25- to 100-foot exclusion zone for passerine birds and a 200- to 500-foot exclusion zone for raptors and special-status species. Exclusion size will be dependent upon species and nest location and will be determined by a qualified biologist based on the species present and location of the nest relative to construction activities (e.g., the nest is sufficiently shielded from construction to avoid disturbance). Construction within this buffer shall be prohibited until the qualified biologist determines that the nest is no longer active. If an active nest is found after the completion of the pre-construction surveys or after construction begins, all construction activities will stop until a qualified biologist has evaluated the nest and determined an appropriate buffer to be placed around the nest. If avoidance of a buffer zone is not feasible, CDFW will be contacted to coordinate an appropriate course of action.

Mitigation Measure BIO-3a: Special-status Amphibian Work Windows

All work within 100 feet of any wetted stream feature or associated riparian area shall be scheduled to occur during the dry season (between June 15 and October 15). Timing should also occur outside of the FYLF breeding season (March 1 to June 30). No work shall occur within 48-hours after a precipitation event. Work within the upland areas of the Project site may occur outside of this window.

Mitigation Measure BIO-3b: Special-status Amphibian Pre-Construction Surveys

Within 48 hours prior to the start of construction work outside of any paved areas of the Project site, a pre-construction survey shall be conducted by a qualified biologist to determine whether the BSA has potential to support special-status amphibians during the time of construction. Surveys should cover at least 500 feet upstream and 500 feet downstream of the work area for presence of all life stages. If any special-status amphibians are observed, the qualified biologist will relocate the individual(s) outside of the work area to suitable habitat and in consultation with CDFW, recommend if a biological monitor is required, or if additional minimization measures shall be implemented. If surface water is present during construction, a qualified biologist shall inspect the work area daily prior to the onset of construction activities for special-status amphibians.

Mitigation Measure BIO-3c: Special-status Amphibian Worker Environmental Awareness Training

Members of all construction work crews that will work on the Project shall undergo a Worker Environmental Awareness Program (WEAP) training conducted by a qualified biologist, which will cover basic identification of all special-status amphibians and review recommended actions should any be discovered within the work area.

Mitigation Measure BIO-4: Pre-Construction Surveys for Northwestern Pond Turtle

- Pre-construction surveys for the northwestern pond turtle should be performed within 24 hours of initiation of in-water Project activities.
    - If no NPT are observed, no monitoring is required.
    - If NPT are observed, the qualified biologist will relocate the individual(s) outside of the work area to suitable habitat and recommend if a biological monitor is required, or other minimization measures implemented, dependent upon work activities. Such measures may include a protective no-work buffer, exclusion fencing, monitoring, or coordination with CDFW if relocation is required.
    - If a biological monitor is not present, and a NPT is observed entering the work area, work will stop in the immediate vicinity and the qualified biologist notified to relocate the individual and assess if additional minimization measures should be implemented.

Mitigation Measure BIO-5: Fish Capture and Relocation Plan

A fish capture and relocation plan shall be prepared for the proposed Project and will be submitted to NMFS for approval no less than 30 days prior to construction. The plan shall be implemented to move fish and other aquatic life in the Project site to a suitable location outside the Project site if streamflow and/or pools are present in the BSA during construction, and if work, including installation of the stream diversion system, would potentially affect aquatic species. At a minimum, the plan will include the following:

- If flow is present, a fish capture and relocation operation shall be conducted prior to construction to remove fish and other aquatic species form the work site. Salmonids and other native species encountered shall be relocated safely to a location where suitable habitat is present. The stream shall be diverted into the temporary channel, and the work area dewatered and isolated from stream flow.
- Fish capture and relocation shall be completed if flowing water or pools with potential to support fish remain in the proposed Project site at the time work in the creek bed occurs, and work activities will be implemented by a qualified biologist during dewatering activities in Maacama Creek. The fish capture and relocation plan will include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish capture and relocation during dewatering activities.
- If dewatering is necessary, pumps with 0.1-inch mesh will be used to remove standing water from the work area within the cofferdams to a filtration basin to prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or be released through filter bags will prevent excessive turbidity or sediment loads during the dewatering process.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS?

There are eight sensitive natural communities within the BSA that could be temporarily or permanently impacted by Project activities: California bay riparian, perennial stream, valley oak woodland, valley oak-Oregon ash woodland, purple needlegrass grassland, mulefat thicket, potential seasonal wetlands, and mixed oak woodland. Permanent impacts would result from reconstruction of the intersection of Young Road and Chalk Hill Road, construction of the new bridge and its support structures, construction of new bridge approach roadways, vegetation removal, and demolition of the existing bridge. Temporary impacts are disturbances to existing natural communities that would be restored to the same natural community type following Project construction. A summary of acreages of temporary and permanent impacts to sensitive natural communities is provided in Table 4.4-1, and a discussion of impacts to each community is provided further below. Impacts to biological communities within the BSA are shown in Figure 4.4-2 and Figure 4.4-3.

Table 4.4-1. Temporary and Permanent Impacts to Sensitive Natural Communities

SENSITIVE NATURAL COMMUNITY TYPE	PERMANENT IMPACTS (ACRES)	TEMPORARY IMPACTS (ACRES)
Seasonal Wetland	0	0
Perennial Stream	0.05	0.10
Mulefat Thicket	0	0.01
Mixed Oak Woodland	0	<0.01
California Bay Riparian	0	<0.01
Valley Oak Woodland	0.11	0.09
Valley Oak – Oregon Ash Woodland	0.02	0.01
Purple Needlegrass Grassland	0	0.12
TOTAL:	**0.18**	**0.33**

Seasonal Wetland

The Project will not impact the seasonal wetland located at the southern portion of the BSA. This area is not within the area of direct impact for any proposed Project activities.

Perennial Stream/In-stream Wetland

A total of 0.10 acre of temporary impacts to perennial stream and 0.01 acres to in-stream wetland would result from installation of the stream diversion system, grading of the channel upon Project completion to return to normal grade, construction of the access ramps, erecting falsework to support the new bridge framework before the abutments are fully secured, and installation of log rootwads as part of the scour countermeasures on the southern streambank. In addition, construction of the Project could risk release of pollutant runoff into the creek from fuels and other materials used for construction, and runoff from grading and excavation work on-site could result in increased sediment deposition in the creek. This constitutes a potentially significant impact to the perennial stream biological community during Project construction.

To avoid and minimize impacts to Maacama Creek during construction, Mitigation Measure BIO-6 would be implemented, which includes measures to prevent pollutant and sediment runoff from entering Maacama Creek. Measures include installing temporary fencing around construction work areas, mandating that all refueling and maintenance of construction equipment occur above the top-of-bank of the creek, and protecting drainage inlets within the Project site. As Maacama Creek is a potential jurisdictional water, the lead agency would also be required to seek permits from applicable regulatory agencies, such as the Corps, RWQCB, and CDFW. Work within Maacama Creek would be required to comply with any conditions imposed by the regulating agencies in the final permits. With implementation of Mitigation Measure BIO-6 and compliance with applicable permit conditions, Project construction would not result in substantial adverse impacts to Maacama Creek.

Approximately 0.05 acres of permanent impacts to the stream would result from shading impacts to riparian vegetation from construction of the new bridge and the installation of vegetated rock slope protection as part of the scour countermeasures on the southern stream bank. Upon completion of the Project, the stream diversion system would be removed, and the creek bed would be regraded to conform to its natural contours. Shading of riparian vegetation would occur from construction of the new bridge across the channel, offset by demolition and removal of the existing bridge, allowing for the establishment and growth of new riparian vegetation. The permanent scour countermeasures include the installation of vegetated rock slope protection with log rootwads to provide for the formation of important fish resting and rearing habitat within the creek. The earthen creek banks and rock slope protection area would be revegetated with native vegetation. These improvements are designed to result in a long-term beneficial impact to perennial stream habitat within the BSA. Therefore, no permanent substantial adverse effect to perennial stream habitat would occur. The impact would be ***less than significant with mitigation incorporated***.

Mixed Oak Woodlands

Mixed oak woodland in the BSA occurs on the outer edge of the construction staging areas. As shown in Figure 4.4-2 and Figure 4.4-3, the Project would not have any direct impacts on mixed oak woodlands. As stated in *Section 2.0, Project Description,* areas that have been temporarily disturbed by construction will be restored with native, non-invasive species after construction. Therefore, the Project would not have a substantial adverse direct or indirect effect on mixed oak woodland. The impact would be ***less than significant***.

California Bay Riparian

As shown in Figure 4.4-2, the Project would result in 0.01 acre of temporary impacts to California bay riparian woodlands. Temporary impacts would result from temporary excavation support encroaching into the area, which would be removed after construction. Limited tree removal within this community may be needed to allow for access to the construction area. Depending on the species of tree(s) that would be removed, the tree(s) would be replaced in accordance with the regulations set forth by the Sonoma County Municipal Code. Mitigation Measure BIO-7 would be implemented, which requires a Revegetation and Habitat Restoration Plan (RHRP). The RHRP would ensure that all removed trees and vegetation would be replaced at an appropriate ratio and monitored to ensure the restoration of habitat is successful. Therefore, the Project would not have a substantial adverse direct or indirect effect on California bay riparian woodland. The impact would be ***less than significant***.

Valley Oak Woodland

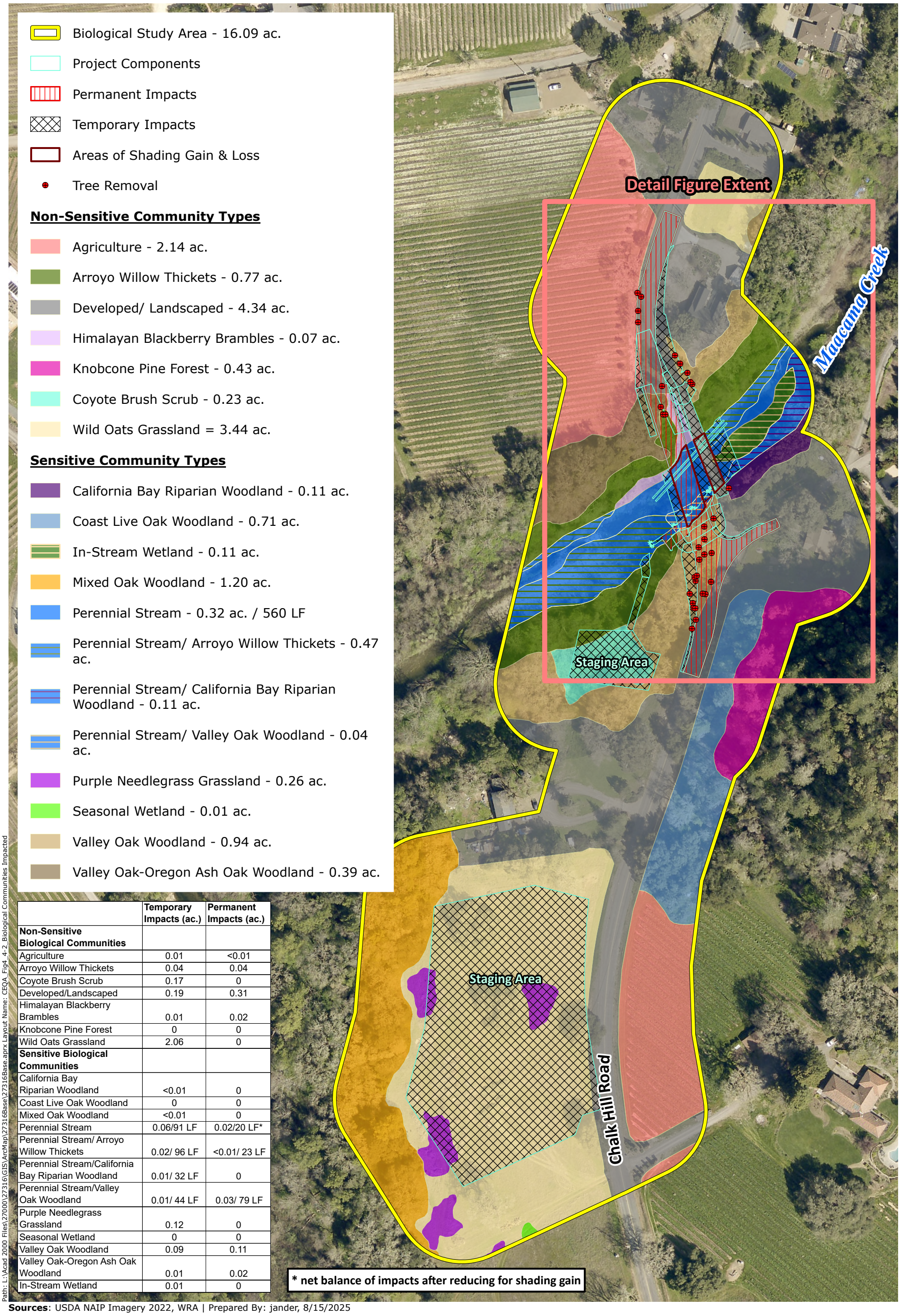
As shown in Figure 4.4-2 and Figure 4.4-3, approximately 0.09 acres of temporary impacts to valley oak woodland would result from erosion control and revegetation along the new bridge approaches and from construction of temporary excavation support structures. Approximately 0.11 acres of permanent impacts would be incurred as a result of the new bridge approaches, and the new alignment of Chalk Hill Road will pass through existing valley oak woodlands. As discussed above, Mitigation Measure BIO-7 would be implemented, which requires a RHRP that shall ensure that all oaks be replaced in kind or in accordance with the stipulations set forth by the Sonoma County Municipal Code and that all vegetation be replaced. With implementation of this measure, the Project would not have a substantial adverse effect on valley oak woodland. The impact would be ***less than significant with mitigation incorporated***.

Valley Oak-Oregon Ash Woodland

Temporary impacts to Valley Oak-Oregon Ash Woodland would result from the construction of temporary excavation supports to remove the existing bridge. Permanent impacts would result from the construction of the new bridge approach and the new alignment of Chalk Hill Road. One tree is anticipated to be removed within this community. As discussed above, Mitigation Measure BIO-7 would be implemented, which requires a RHRP that shall ensure that all oaks be replaced in kind or in accordance with the stipulations set forth by the Sonoma County Municipal Code and that all vegetation be replaced. With implementation of this measure, the Project would not have a substantial adverse effect on valley oak-Oregon ash woodland. The impact would be ***less than significant with mitigation incorporated***.

Purple Needlegrass Grassland

As shown in Figure 4.4-2, approximately 0.12 acres of temporary impacts to purple needlegrass grassland would result from the staging of construction materials and equipment. As required by Mitigation Measure BIO-7, the implementation of an RHRP shall ensure that all vegetation be replaced by native vegetation. Therefore, the Project would not have a substantial adverse effect on purple needlegrass grassland. The impact would be ***less than significant with mitigation incorporated***.



	Temporary Impacts (ac.)	Permanent Impacts (ac.)
Non-Sensitive Biological Communities		
Agriculture	0.01	<0.01
Arroyo Willow Thickets	0.04	0.04
Coyote Brush Scrub	0.17	0
Developed/Landscaped	0.19	0.31
Himalayan Blackberry Brambles	0.01	0.02
Knobcone Pine Forest	0	0
Wild Oats Grassland	2.06	0
Sensitive Biological Communities		
California Bay Riparian Woodland	<0.01	0
Coast Live Oak Woodland	0	0
Mixed Oak Woodland	<0.01	0
Perennial Stream	0.06/91 LF	0.02/20 LF*
Perennial Stream/ Arroyo Willow Thickets	0.02/ 96 LF	<0.01/ 23 LF
Perennial Stream/California Bay Riparian Woodland	0.01/ 32 LF	0
Perennial Stream/Valley Oak Woodland	0.01/ 44 LF	0.03/ 79 LF
Purple Needlegrass Grassland	0.12	0
Seasonal Wetland	0	0
Valley Oak Woodland	0.09	0.11
Valley Oak-Oregon Ash Oak Woodland	0.01	0.02
In-Stream Wetland	0.01	0

Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\273316Base.aprx Layout Name: CEQA_Fig4_4-2_BiologicalCommunities Impacted

Sources: USDA NAIP Imagery 2022, WRA | Prepared By: jander, 8/15/2025

Figure 4.4-2 Biological Communities Impacted within the Biological Study Area (Overview)

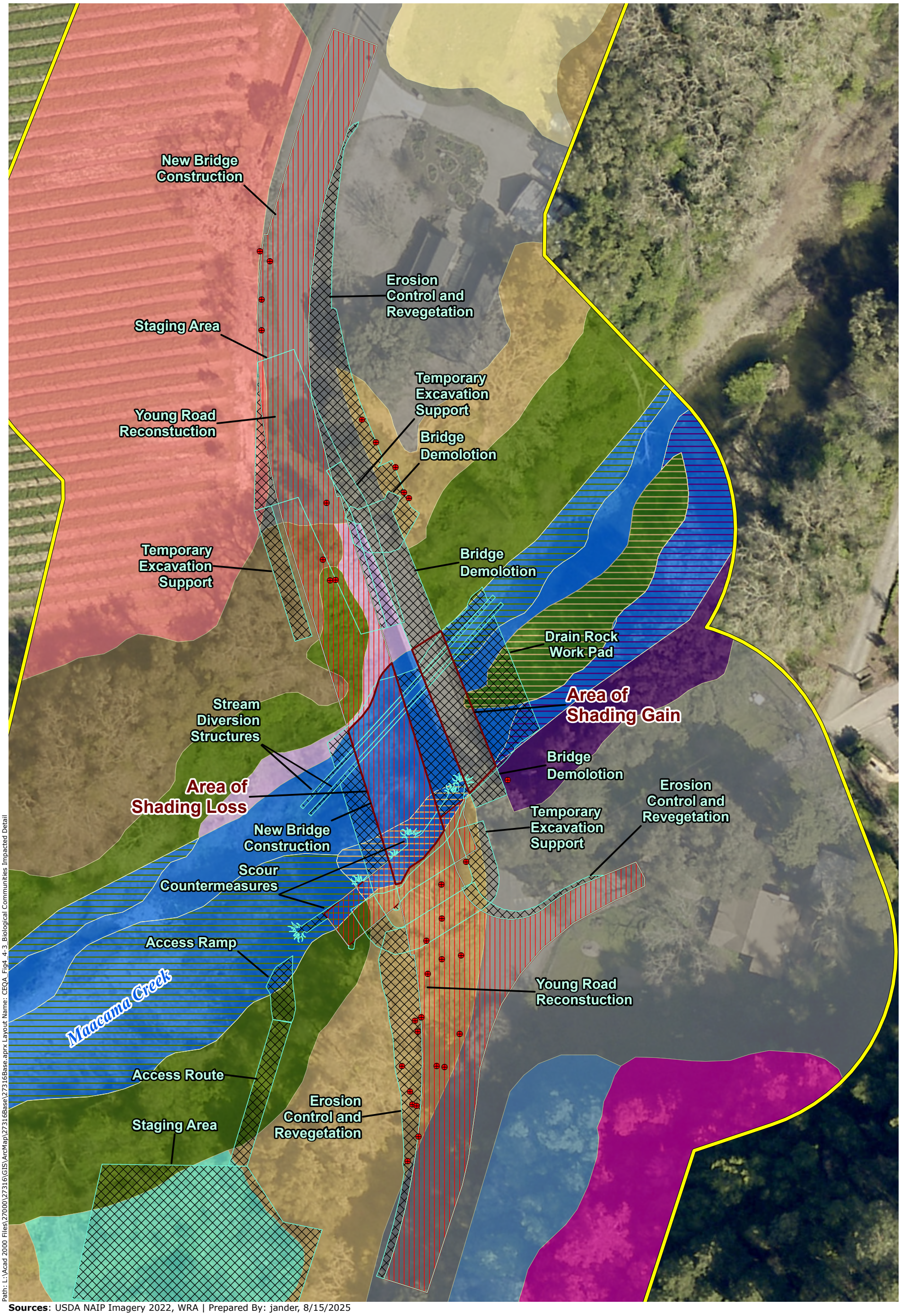
Chalk Hill Road Bridge Replacement

Sonoma County, California

0 200 400 Feet

N

wra Environmental Consultants



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: CEQA_Fig4_4-3_Biological Communities Impacted Detail

Sources: USDA NAIP Imagery 2022, WRA | Prepared By: jander, 8/15/2025

Figure 4.4-3 Biological Communities Impacted within the Biological Study Area (Detail)

Chalk Hill Road Bridge Replacement

Sonoma County, California

0 50 100 Feet

N

wra Environmental Consultants

Mitigation Measures

Mitigation Measure BIO-6: Perennial Stream Construction Measures

To avoid and reduce impacts to the perennial stream biological community, the following measures shall be implemented:

- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction shall be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas and to prevent any equipment from unnecessarily extending the work area or entering the creek bed. In addition, silt fencing will be installed where appropriate to prevent debris from entering the creek. All fencing will be removed upon Project completion.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment, spill control absorbent material shall be placed underneath equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, must occur outside the creek's top-of-bank. Any hazardous chemical spills shall be cleaned immediately.
- When working on the roadway and bridge approaches during the wet season, all drainage inlets within the Project site will be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- The construction contractor shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from construction work are deposited in covered or closed trash containers. The trash containers will not be left open and unattended overnight.
- During the year after construction, the Project site will be inspected during the rainy season. Areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken.

Mitigation Measure BIO-7: Revegetation and Habitat Restoration Plan

The lead agency shall prepare a Revegetation and Habitat Restoration Plan (RHRP) prior to the initiation of ground disturbing activities. The RHRP shall be prepared by a qualified restoration ecologist or biologist. The RHRP shall use only locally appropriate, native plant species characteristic of the impacted habitat types. The RHRP shall describe seeding and planting techniques, seasonal timing of installation, irrigation (if needed), and protection measures (e.g., wildlife exclusion fencing, erosion control). The RHRP shall also establish quantitative success criteria, requirements for annual monitoring, and contingency measures if performance standards are not met within the monitoring period. Restoration activities shall commence within one growing season following completion of the second construction season. The lead agency shall oversee compliance with the RHRP, with technical support as needed from a qualified restoration specialist.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Approximately 0.01 acres of seasonal wetland is present within the very southern portion of the BSA. As described above in Threshold b), no project work would occur in this portion of the BSA. The seasonal wetland would be entirely avoided by Project work. Therefore, the Project would not have a substantial adverse effect on any state or federally protected wetlands. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

To account for potential impacts to wildlife movement/migratory corridors, WRA biologists reviewed maps from the California Essential Connectivity Project (Caltrans 2010), and habitat connectivity areas identified by the County's General Plan. Additionally, aerial imagery for the local area was referenced to assess if local core habitat areas were present within or connected to the Project site. This assessment was refined based on observations of on-site physical and/or biological conditions, including topographic and vegetative factors that can facilitate wildlife movement, as well as on-site and off-site barriers to connectivity.

Wildlife movement corridors within the Project site include Maacama Creek, which provides fish passage for a variety of anadromous species and is designated Essential Fish Habitat for the Pacific coast salmon. Temporary and permanent impacts to Maacama Creek that would result from the proposed Project are discussed above in Thresholds a) and b). All Project construction work would occur during the dry season to avoid impacts to fish species to the extent feasible. As described in Mitigation Measure BIO-4, if flow is present in the creek at the start of Project construction, a fish capture and relocation operation shall be conducted prior to construction to remove fish and other aquatic species form the work site. Salmonids and other native species encountered shall be relocated safely to a location where suitable habitat is present. The stream shall be diverted into the temporary channel, and the work area dewatered and isolated from stream flow. After construction is complete, the stream diversion system would be removed, and the creek bed would be regraded to conform to its natural contours. Shading of riparian vegetation would occur from construction of the new bridge across the channel, offset by demolition and removal of the existing bridge, allowing for the establishment and growth of new riparian vegetation. The permanent scour countermeasures include the installation of vegetated rock slope protection with log rootwads to provide for the formation of important fish resting and rearing habitat within the creek. The earthen creek banks and rock slope protection area would be revegetated with native vegetation. These improvements are designed to result in long-term benefits to Maacama Creek, including species migration. Therefore, with implementation of Mitigation Measure BIO-4, the Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure BIO-4 would be implemented to reduce potential impacts to a less-than-significant level.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The BSA falls under the jurisdiction of Sonoma County, which provides protection for biological resources through the implementation of its General Plan and Zoning Code. Compliance with applicable local policies and ordinances pertaining to biological resources is discussed below.

Sonoma County General Plan

The Sonoma County General Plan OSRC Element contains policies to protect biological resources including, but not limited to waters, fish and wildlife habitat, biotic areas, and habitat connectivity corridors. Specifically, Policy OSRC-7k, Policy OSRC-7l, and Policy OSRC-7m require the protection of native trees and woodlands and oak woodlands. As described above under Threshold b) and further below under *Sonoma County Code of Ordinances,* the Project would require the removal of some native trees and vegetation, including valley oak woodlands. However, the Project would replace all trees removed by the Project in kind with native tree species. Mitigation Measure BIO-7 would be implemented, which requires the preparation of RHRP that shall establish quantitative success criteria, requirements for annual monitoring, and contingency measures if performance standards are not met during monitoring period. With implementation of this mitigation measure, the Project would not conflict with policies of the General Plan pertaining to native vegetation or valley oak woodlands.

Policy OSRC-8a, Policy OSRC-8b, Policy OSRC-8c, Policy OSRC-8d, Policy OSRC-8e establish protections for Riparian Corridors, which are corridors adjacent to all designated streams within the County. Policy OSRC-8b establishes a streamside conservation area along both sides of designated Riparian Corridors, measures from the top of the higher bank of each side of the stream. The streamside conservation corridor for Maacama Creek extends 50 feet from each side of the stream. Policy OSRC-8d allows for the consideration of certain uses within any streamside conservation area, including streamside maintenance and restoration, and road, street, and utility crossings. Policy OSRC-8e prohibits grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots within any streamside conservation area, aside from certain exceptions. The proposed Project would consist of replacement of the existing bridge along Chalk Hill Road over Maacama Creek, and associated relocation of utilities and transportation infrastructure. While this work would require grading, excavation, and vegetation removal within the streamside conservation corridor for Maacama Creek, this Project is being undertaken to replace existing infrastructure and would not include any new development. Upon completion of Project construction, all disturbed areas of the creek and riparian corridor would be restored, and a RHRP would be implemented to ensure the success of replanted vegetation. Therefore, the Project would not conflict with policies of the OSRC Element pertaining to Riparian Corridors.

As discussed above in Impacts a) and b), the Project would implement mitigation measures to ensure that no substantial adverse effects to special-status species, habitats, or sensitive biological communities would occur. Therefore, the Project would not conflict with any goals, policies, or objectives of the County's General Plan pertaining to the protection of biological resources. Therefore, the impact would be ***less than significant with mitigation incorporated***.

Sonoma County Code of Ordinances

Portions of the Project site are within the Riparian Corridor, Oak Woodland, and Valley Oak Woodland combining zoning districts. Regulations on development and land use within the combining districts is enforced by the Sonoma County Code of Ordinances. A discussion of the Project's consistency with applicable regulations is provided below.

Tree Protection Ordinance

The Sonoma County Tree Protection Ordinance is contained in Chapter 26, Article 88. Sec. 26-08-010 (m) of the Sonoma County Code of Ordinances. The ordinance designates 'protected' trees and provides mitigation standards for impacts to protected trees. Of the 74 trees within the

Project site, 42 would be removed as part of the Project including 36 trees that are likely to be considered protected trees under the Tree Protection Ordinance or protected riparian trees under the CFGC. The 36 protected trees to be removed include two arroyo willows, three blue oaks, eight California black oaks, five coast live oaks, two sandbar willows, one Northern California black walnut, one Oregon ash, two red willows, two valley oaks, and 10 white alders. Protected trees to be removed are shown on the figures in Appendix D.

This ordinance is not applicable to County public works projects; therefore, the Project would not conflict with the Tree Protection Ordinance. Although the Project is not required to comply with this ordinance, the Project would implement a RHRP, as described in Mitigation Measure BIO-7, which would use the Tree Protection Ordinance as a guide for determining appropriate tree replacement ratios for the Project. ***No impact*** would occur.

Riparian Corridor Ordinance

The Riparian Corridor combining zone is designed to protect biotic resource communities, including critical habitats located within and adjacent to riparian corridors, due to their ecological and environmental significance. It supports the implementation of the General Plan's OSRC Element and Water Resources Element. The intent of these policies is to preserve and enhance riparian corridors and their ecological functions along designated streams, while accommodating compatible land uses such as agriculture, urban development, timber harvesting, and mining.

The RC zone aims to protect riparian vegetation, water resources, floodplain functions, wildlife habitat and movement, stream shading, fisheries, water quality, channel stability, and groundwater recharge. It also supports recreational, educational, and aesthetic uses associated with riparian environments. Although this ordinance does not apply directly to County public works projects, it serves as a guiding framework for evaluating potential impacts and identifying suitable mitigation measures.

The proposed Project would not conflict with the Riparian Corridor Ordinance. Upon Project completion, the stream would be graded to the natural contours using native gravel. All trees and vegetation that would be removed for construction would be replaced in kind with native species. The Project would implement Mitigation Measure BIO-7 which requires a RHRP to ensure the success of replanted vegetation. Therefore, the Project would not conflict with the Riparian Corridor Ordinance. ***No impact*** would occur.

Mitigation Measures

Mitigation Measures BIO-1, BIO-2, BIO-3a, BIO-3b, BIO-3c, BIO-4, BIO-5, BIO-6, and BIO-7 would be implemented to reduce potential Project impacts to a less-than-significant level.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Project site is not located within any area subject to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved, local, regional or state habitat conservation plan. Therefore, ***no impact*** would occur.

Mitigation Measures

No mitigation measures are required.

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4.5 Cultural Resources

This section describes the existing cultural resources setting of the Project site, identifies associated regulatory requirements, evaluates potential Project level impacts, and identifies mitigation measures as necessary to reduce the project's impacts related to cultural resources.

The information and analysis summarized in this section is based on the following reports prepared for the proposed Project:

- Far Western. 2024. Archaeological Survey Report for the Chalk Hill Road Bridge over Maacama Creek Replacement Project (Bridge No. 20C-0242), Sonoma County, California. Reviewed for approval by Caltrans District 4. Far Western Anthropological Research Group, Inc. Davis, California.
- Far Western. 2024. Extended Phase I Report for the Chalk Hill Road Bridge over Maacama Creek Replacement Project (Bridge No. 20C-0242), Sonoma County, California. Reviewed for approval by Caltrans District 4. Far Western Anthropological Research Group, Inc. Davis, California.
- Mikesell Historical Consulting. 2024. Historical Resources Evaluation Report for Chalk Hill Road Bridge (Bridge No. 20C-0242) over Maacama Creek Replacement Project. Reviewed for approval by Caltrans District 4. Federal Aid Project No. BRLO-5920(118).

4.5.1 Environmental Setting

This section describes the existing cultural resources conditions in the Project area and identifies the resources that could be affected by the proposed Project.

AREA OF POTENTIAL EFFECTS

The Area of Potential Effects (APE) encompasses 54.45 acres and includes all possible areas of horizontal and vertical direct impact for the Project. The Area of Direct Impact (ADI) is defined as the actual footprint for where ground disturbance is anticipated and encompasses 5.38 acres. The vertical depth of disturbance would reach a maximum depth of 60 to 80 feet below ground surface west of the existing roadway for the installation of the new bridge abutments. No excavation would occur within the creek channel except for the removal of the existing bridge footings (anticipated to require three feet of below ground surface disturbance). Vegetation and soil removal would take place along the creek bank to a depth of two feet to support the scour countermeasures and the new bridge. The demolition of the existing bridge would involve up to two to four feet of excavation to accommodate removal activities. The APE includes five built environment properties: the Chalk Hill Road bridge and four single-family homes.

ARCHAEOLOGICAL CONTEXT

Archaeological studies of the North Coast Ranges conducted in early half of the 20th century helped establish a chronological framework that has influenced subsequent research in the region. Once of the more influential of these later efforts is Fredrickson's 1973 dissertation, which proposed a cultural sequence focused on the Clear Lake area but has since been applied to neighboring areas, including Sonoma County. The following discussion presents the cultural chronology developed by Fredrickson (1989, 1974) and later built upon by Hildebrandt (2007) and Milliken (2007). This chronology is divided into three broad time periods: Paleoindian, the three-stage Archaic period, and the Emergent period.

Paleoindian Period (ca. 10,000-6000 BC)

Few occupations in California have been firmly dated to the terminal Pleistocene and Early Holocene, which is due in part to the low archaeological visibility assumed to be characteristic of the population of this period, which likely consisted of small, highly mobile groups. Currently, the earliest accepted evidence of human occupation are basally thinned and fluted concave-base projectile points. Other flaked tools which may date to this period have been found along the Mendocino County coast and Bodega Head.

Archaic Period (6000 BC-AD 500)

The Archaic period consisted of the Lower Archaic period (6000-3000 BC), the Middle Archaic period (3000-1000 BC), and the Upper Archaic period (1000 BC-AD 500). As the climate warmed and grew wetter at the end of the Pleistocene, significant amounts of alluvium were deposited in the Central Valley an elsewhere in California, which is evident in clear stratigraphic boundaries between sediments from the Late Pleistocene and Holocene throughout central California. This interval corresponds to the Lower Archaic Period. Several archaeological sites in the region have been dated to this period, and recovered artifacts consist of tools and debris such as wide-stemmed projectile points, stone millingslabs and other flaked tools, contracting-stemmed and square-stemmed projectile points, formalized burial patterns, pestles, and acorn remains.

The Middle Archaic period is marked by significant climatic changes during which warmer and drier conditions led to desiccation of lake basins in southern California. Initially, central California experienced increased alluvial deposition on fans and floodplains but soon entered a period of stasis. The Middle Archaic period is marked by new ground stone technology as well as increased regional trade as evidenced by cut shell beads within mortuary contexts. Mortars and pestles first appear in Middle Archaic sites in the Bay Area and are thought to signal an increased dietary reliance on acorns and a simultaneous increase in sedentism.

Climatic changes at the start of the Upper Archaic period led to cooler, wetter conditions that were more favorable for human occupation. Sites from this time show clear differences from earlier occupations, with well-developed middens, abundant acorn remains, and new technology and elaborate decorative items. Artifacts from these sites indicate a higher degree of sedentism and intensive use of acorns, large terrestrial game, and fish. Bone tools, such as barbless fish spears, elk femur spatulae, and basketry awls, also appeared in this time period.

Emergent Period (AD 500-1500)

The beginning of the Upper Emergent period coincides with the arrival of the Spanish explorers in what is now North and South America, and the lifeways practiced by Native people during this period are thought to be similar to those observed by the early non-native chronicles. This period is also characterized by unsettled climatic events which occurred over much of the western United States. The Emergent period is associated with a new level of sedentism, status ascription, and ceremonial integration in lowland central California. Similar to the Upper Archaic period, this period is marked by wide-ranging changes in Olivella bead forms and distribution patterns. It is also during this time period that the first evidence of inland manufacture of Olivella beads. Clamshell disk beads began to spread across the North Bay at the end of this period, and new technological innovations are also present, including the toggle harpoon and hopper mortar.

ETHNOGRAPHIC CONTEXT

Refer to *Section 4.18, Tribal Cultural Resources*, for a discussion of the ethnographic setting of the Project site.

HISTORIC CONTEXT

Chalk Hill Road is a rural north-south minor collector road that begins at Pleasant Avenue/Faught Road to the south and proceeds north approximately eight miles to its terminus at State Highway 128 in unincorporated Sonoma County. Chalk Hill Road is roughly ten miles from the small, unincorporated community of Geyserville and about the same distance from the larger city of Healdsburg. The history of the Chalk Hill area is tied most closely with developments in Geyserville and Healdsburg, and the region of Sonoma County called Alexander Valley.

The Chalk Hill area was included within the Sotoyome Rancho, granted by the California Mexican government to Captain Henry Delano Fitch in 1840. Fitch married the sister of General Mariano Vallejo, a leading figure and sometimes governor of Mexican California. The vast rancho encompassed 48,800 acres that included modern Healdsburg and the Alexander Valley. When Fitch's grandchildren lost the land to foreclosure, Fitch hired Cyrus Alexander to manage the Sotoyome Rancho. Fitch gave a large part of the rancho to Alexander for his work and Alexander in turn gave his name to the Alexander Valley.

The City of Healdsburg was founded in 1851 and incorporated in 1867. The Healdsburg region became an important wine-producing region in the 1880s, which prospered until the institution of Prohibition in the 1920s. Most vines were destroyed during the 1920s and replaced by tree crops; however, the wine industry reappeared in the 1970 and is now the dominant element of the local economy, joined by tourism which is fed to a large degree by the popularity of Healdsburg wines. Geyserville gained its name from a series of geysers in the area, which were first identified in 1847. The small village grew slowly compared to the nearby Healdsburg but was influenced by the same agricultural trends: grazing in the mid-19th century, viticulture in the late 19th century and early 20th centuries, followed by tree crops during Prohibition and the return of viticulture in the 1970s.

In 1867, the Project site was part of a 160-acre parcel owned by James G. Hood, who operated a winery before moving the operation to Santa Rosa in 1902. Between 1897 and 1928, however, parts of Hood's land had been subdivided, in some cases to very small parcels. Included in this was a subdivision just north of the project site called "Orchard Homes."

Both Healdsburg and Geyserville benefitted substantially from construction of railroads in the area, the first being the San Francisco and North Pacific Railroad, which was incorporated in 1869 and extended north to Healdsburg and Geyserville in 1872. The line was purchased by the Southern Pacific Railroad in the 1890s to serve as the southern end of the larger Northwestern Pacific Railroad, which extended from Marin County to Humboldt County. The Northwestern Pacific began to fail in the 1980s and today only small portions are in use, although the southern stretch is now being used by the Sonoma-Marin Area Rail Transit (SMART) line.

INFORMATION CENTER RECORDS SEARCH

A records search at the Northwest Information Centre of the California Historical Resources Information System at Sonoma State University in Rohnert Park was conducted on October 25, 2018. This included a review of all cultural resources records and report within 0.5 mile of the APE. Primary reference materials included USGS 7.5-minute base maps, site records, report files,

and the Directory of Properties in the Historical Properties Data Files. Far Western also conducted an in-house literature review and consulted the following online inventories:

- Caltrans Historic Bridge Inventory
- National Register of Historic Places
- National Register of Historical Resources
- California Inventory of Historic Resources (1976 and updates)
- California State Historical Landmarks (1996 and updates)
- California State Points of Historical Interest (1992 and updates)
- Office of Historic Preservation's Historical Property Data File

Results of the records search indicated that three prior cultural resources studies have been conducted in the APE, which covered approximately 42 percent of the APE. These studies have been large scale surveys or identification efforts, focusing particularly on historic bridge inventory and evaluations of cultural resources along the County right-of-way. Seven additional studies have been conducted within 0.5 mile of the APE, which have largely been small surveys of adjacent properties.

The records search results indicated one previously documented archaeological resource within the APE, but outside of the ADI. One historic-era built environment resource, the Chalk Hill Road Bridge, is also documented within the APE. There are three other archaeological resource and one built environment resource documented within 0.5 mile of the APE.

ARCHAEOLOGICAL SENSITIVITY ASSESSMENT

Before subsurface and buried sites can be avoided, sampled, or otherwise evaluated, they must first be identified. Most buried sites are not found by conventional pedestrian surface surveys because they typically lack visible features that would indicate their presence to an observer in the field (Bettis 1992). Thus, locating sites that are buried by natural sediment deposition is very difficult.

Potential for Historic-era Resources

While precontact buried and submerged site analysis relies primarily on geological, geomorphological, and environmental factors, subsurface historic-era site potential depends on the written record, known developments and documented historic-era resources, and an understanding of modern and historical disturbances. The potential for subsurface historic-era built-environmental and archaeological resources described in this section is based on the results of a records search and literature and map review.

The primary historic-era resource in the APE is the Chalk Hill Road Bridge, a National Register-eligible built-environment resource built in 1915. A review of historical literature and available maps suggest there was no other development in the ADI aside from the Chalk Hill Road Bridge in 1915 and the immediate local agriculture/ranch land use in the area. The four nearby residences within the APE were constructed in 1915 (14657 and 14710 Chalk Hill Road), 1931 (14841 Chalk Hill Road), and 1946 (14544 Chalk Hill Road). It is common for associated domestic refuse features and ancillary structures to be located in open spaces/yards within proximity to the home. During the late-nineteenth and early twentieth century when municipal garbage collection was non-existent or a burgeoning service, it was common for domestic refuse to accumulate in pits, privies, wells, or surface scatters around homes. In areas where creeks or other hollow geological features were present, they often became expedient refuse deposition and accumulation locations. As such, there is the possibility that refuse material and agricultural

and structural remains may be present within the APE; however, given the few historic-era developments in the APE, outside of the bridge and the roadway, there is a low likelihood of encountering historic-era archaeological deposits or features.

Potential for Buried Prehistoric Archaeological Resources

Many Holocene-age alluvial deposits were formed after prehistoric people had occupied the region; therefore, deposits of this age have a general "geologic potential" to contain buried sites. Conversely, there is little to no potential for buried sites to occur in landforms that pre-date the Holocene because few, if any, people were present in the region at that time. Additionally, archaeological deposits tend to occur in specific geo-environmental settings (Foster and Sandelin 2003, Hansen et al. 2004, Pilgrim 1987, Rosenthal and Meyer 2004a). For instance, it is well known that prehistoric occupation sites are often associated with level landforms that occur near perennial streams, especially near the confluence of one or more streams (Pilgrim 1987).

Analysis of precontact sites in other areas of western California indicates that the majority are located within 200 meters of a present or former water source, such as a spring, stream, or river channel (Rosenthal and Meyer 2004b). As such, many sites are located in settings that were subject to periodic flooding and sediment deposition due to the combination of low-lying topography and active water sources, such as those that prevailed in and near the APE. Thus, Holocene-age deposits located within 200 meters of a historic-era stream or river are generally considered to have an elevated (i.e., High or Highest) potential to contain buried sites.

Assessment of Buried Site Potential

The potential for subsurface and buried sites within the APE is estimated to be High. The APE is immediately north and south of Maacama Creek, and the bridge replacement work spans the creek itself. Both mapped surface soils and buried soils, exposed in a cutbank, likely date to the Holocene. While no precontact artifacts or midden soil was observed on the ground surface during the survey, an archaeological site has been previously documented immediately east of the APE. It has also been reported by property owners that artifacts have been found in the creek.

FIELD SURVEY

On April 11 and June 13, 2019, a Far Western archaeologist conducted a field survey of the APE using 10-meter transects whenever possible. Approximately 99.5 percent of the 6.4-acre survey was covered. The remaining 0.35-acres was inaccessible due to dense vegetation and its location within the inundated Maacama Creek bed. Most of the ground surface in the survey area was obscured by dense grasses and other vegetation; however, numerous back-dirt piles from rodent holes and cut banks provided a glimpse of subsurface deposits, resulting in approximately 10 percent ground visibility. No cultural materials were noted on the surface of the survey area or within rodent back dirt piles.

EXTENDED PHASE I STUDY

Hand augering and backhoe trenching were performed on June 29, 2022, and June 30, 2022, as part of an Extended Phase I Study for the Project (Far Western 2024b). Three backhoe trenches at north bridge approach and two backhoe trenches at the south bridge approach were excavated at approximately one meter in depth. Hand augering was conducted with a three-inch diameter auger. While the work plan proposed that augers be excavated to a depth of up

to eight feet, only one of the five augers at the north bridge approach was able to reach below approximately three feet due to impenetrable obstacles, including tree roots and rock. Three auger bores were proposed at the south bridge approach, only one of which was successfully excavated at 2.3 feet below surface due to impenetrable rock layers.

No precontact or historic-era material was recovered in any of the eight auger bores excavated during testing. No intact archaeological deposits were encountered in any of the five backhoe trenches; however, one single obsidian flake was identified and potentially historic-era materials were encountered.

BUILT ENVIRONMENT

Six architectural properties are located within the APE, five of which were built before 1970. The property at 14830 Chalk Hill Road was constructed in 2006 and therefore is not considered eligible for inclusion on the National Register, as structures must generally be at least 50 years old to be considered historic. The other five architectural properties within the APE that were built before 1970 are shown in Table 4.5-1 below.

Table 4.5-1. Architectural Properties within the APE

NAME	APN	NATIONAL REGISTER ELIGIBILITY	CALIFORNIA REGISTER ELIGIBILITY
Chalk Hill Road Bridge	None	Determined eligible (Criterion C)	Listed
14657 Chalk Hill Road	132-080-022	Not eligible	Not eligible
14710 Chalk Hill Road	132-080-023	Not eligible	Not eligible
14544 Chalk Hill Road	132-080-003	Not eligible	Not eligible
14741 Chalk Hill Road	132-060-013	Not eligible	Not eligible

The Chalk Hill Road Bridge, on Sonoma County right-of-way, is within the APE. The bridge has been previously determined to be individually eligible for listing in the National Register at the local level under Criterion C, with a period of significance from 1915 and is therefore automatically listed in the California Register. The Chalk Hill Bridge was determined eligible in the initial Caltrans Historic Bridge inventory in the late 1980s and was found to continue to be eligible in the 2014 update to the Caltrans Historic Bridge Inventory. It is also a Sonoma County landmark.

The four residences along Chalk Hill Road were built at various times before 1970. Most have been modified extensively and were determined not eligible for listing in the National or California Registers.

Chalk Hill Road Bridge

The Chalk Hill Road Bridge over Maacama Creek is a poured-in-place open-spandrel reinforced concrete bridge, which includes a main arched span of 110 feet and three approach spans of 10, feet, 20 feet, and 20 feet. The one-lane bridge features decorate concrete railings, major sections of which have been replaced with metal beam railing. The bridge was known historically as the Maacama Creek Bridge, as documented by a dedication plaque on the southeast corner of the rail.

The bridge is eligible under National Register Criterion C as an early example of an open-spandrel concrete arch bridge. Elements of the bridge that contribute to its significance include: the open-spandrel concrete arch design, including arch rings and spandrel columns; the window-style concrete bridge railing; the construction plaque in the railing; and the concrete deck and driving surface. The bridge was designed by Commonwealth Engineering, a Napa County construction company that specialized in building concrete bridges.

4.5.2 Regulatory Setting

FEDERAL REGULATIONS

National Historic Preservation Act Section 106

Under Section 106 of the National Historic Preservation Act (NHPA), when a federal agency is involved in an undertaking, it must take into account the effects of the undertaking on historic properties (36 Code of Federal Regulations (CFR) Part 800). Compliance with Section 106 requires that agencies make an effort to identify historic properties that might be affected by a project.

The National Register of Historic Places (National Register) defines a historic property as a district, site, building, structure, or object significant in American history, architecture, engineering, archaeology, and culture, and that may be of value to the nation as a whole or important only to the community in which it is located.

A property is eligible for inclusion on the National Register if it is significant under one or more of the following criteria:

- Criterion A: It is associated with events that have made a significant contribution to the broad patterns of our history.
- Criterion B: It is associated with the lives of persons who are significant in our past.
- Criterion C: It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D: It has yielded, or may be likely to yield, information important in prehistory or history.

STATE REGULATIONS

California Register of Historical Resources

The California Register of Historical Resources (California Register) was designed by the State Historical Resources Commission to identify, evaluate, register, and protect California's historical resources. The California Register program encourages recognition and protection of architectural, historical, archaeological, and cultural resources; identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under CEQA.

As set forth in Section 5024.1(c) of the Public Resources Code for a cultural resource to be deemed "important" under CEQA and thus eligible for listing on the California Register, it must meet at least one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California History and cultural heritage; or
2. Is associated with the lives of persons important to our past; or
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic value; or

4. Has yielded or is likely to yield, information important to prehistory or history.

Historic-era structures older than 50 years are most commonly evaluated in reference to Criterion 1 (important events), Criterion 2 (important persons), or Criterion 3 (architectural value). To be considered eligible under these criteria, the property must retain sufficient integrity to convey its important qualities. Integrity is judged in relation to seven aspects including: location, design, setting, materials, workmanship, feeling, and association. Prehistoric and historic-era archaeological resources are commonly evaluated with regard to Criterion 4 (research potential).

Guidelines for the implementation of CEQA define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section 15064.5(b) prescribes that project effects that would "cause a substantial adverse change in the significance of an historical resource" constitute significant effects on the environment. Substantial adverse changes include both physical changes to the historical resource or to its immediate surroundings.

Section 21083.2 of the CEQA guidelines also defines "unique archaeological resources" as "any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and show that there is a demonstrable public interest in that information.
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

This definition is equally applicable to recognizing "a unique paleontological resource or site." CEQA Section 15064.5 (a)(3)(D), which indicates "generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history," provides additional guidance.

California Public Resources Code

Section 5097.5 of the California PRC states:

"No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor."

As used in this section, "public lands" means lands owned by or under the jurisdiction of the State or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC Section 5097.5 for their own activities, including construction and maintenance, as well as for permit actions undertaken on public lands by others.

Codes Governing Human Remains

The handling of human remains is regulated by Health and Safety code Section 7070.5 and PRC Sections 5097.94 and 5097.98 and falls under the authority of the Native American Heritage Commission (NAHC). If human remains are found, the county coroner must be notified within 48 hours, and no further disturbance of the site where the remains were found should occur. Should the coroner determine that the remains are of Native American origin, they are required to notify the NAHC within 24 hours. In accordance with PRC Section 5097.5, the NAHC will promptly notify those persons it believes to be most likely descended from the deceased Native Americans so they can inspect the burial site and make recommendations for the treatment of the remains.

REGIONAL AND LOCAL REGULATIONS

Sonoma County Code

The Sonoma County Board of Supervisors has recognized that preserving structures, sites, and areas of historical, architectural, and aesthetic significance serves the general welfare of the citizens of Sonoma County. To support this goal, the Sonoma County Landmarks Commission was created in 1974 and has the authority to designate Historic Landmarks and establish Historic Districts to safeguard the County's historic resources.

As stated in Sonoma County Code Section 26-68-005, the intent of the Historic District Combining District is to "protect those structures, sites, and areas that are reminders of past eras, events, and persons important in local, state, or national history, or which provide significant examples of architectural styles of the past, or which are unique and irreplaceable assets to the County and its communities." Any structure, site, or area linked to significant historical events or figures, or representing important architectural styles, may be considered for designation as a Sonoma County Historic Landmark. Any proposed modifications, retrofitting, or demolition of a designated County Landmark, as well as new construction within a Historic District, must undergo review by the Landmarks Commission, as outlined in Sonoma County Code Sections 26-68-020 through 26-68-030.

In January 1998, the Board of Supervisors designated 10 County-owned bridges, including the Chalk Hill Road Bridge, as County Landmarks and rezoned them to a HD district, establishing a County Historic Bridges Thematic District (Resolution 98-0046). The Resolution also outlined procedures for the process of reviewing proposed changes to the historic bridges.

The Project was presented to the Landmarks Commission on Tuesday, November 18, 2025. A follow up letter was sent to the Landmarks Commission on March 13, 2026, that described proposed mitigation measures for the removal of the historic bridge. The Landmarks Commission responded on April 6, 2026, stating that they had no feedback on the proposed measures at the time.

The proposed mitigation measures were presented to the Landmarks Commission at the Commission's June 2, 2026 meeting. The Commission made suggestions to enhance the proposed mitigations, including incorporating a visual rendering (e.g., drawing or photograph) and pieces of the existing bridge into a historic bridge monument on the Project site.

Sonoma County General Plan

The Sonoma County General Plan contains the following applicable policies related to cultural resources:

Policy OSRC-19a: Designate the County Landmarks Commission to review projects within designated historic districts.

Policy OSRC-19b: Refer proposals for County Landmark status and rezonings to the Historic Combining District to the County Landmarks Commission.

Policy OSRC-19e: Refer applications that involve the removal, destruction or alteration of a structure or cemetery identified in a historic building survey to the Landmarks Commission for mitigation. Measures may include reuse, relocation, or photo documentation.

Policy OSRC-19h: Designate the County Landmarks Commission to administer a preservation program for stabilization, rehabilitation, and restoration of historic structures.

Policy OSRC-19j: Develop an archaeological and paleontological resource protection program that provides:

(1) Guidelines for land uses and development on parcels identified as containing such resources,

(2) Standard project review procedures for protection of such resources when discovered during excavation and site disturbance, and

(3) Educational materials for the building industry and the general public on the identification and protection of such resources.

Policy OSRC-19k: Refer applications for discretionary permits to the Northwest Information Center to determine if the project site might contain archaeological or historical resources. If a site is likely to have these resources, require a field survey and preparation of an archaeological report containing the results of the survey and include mitigation measures if needed.

Policy OSRC-19l: If a project site is determined to contain Native American cultural resources, such as sacred sites, places, features, or objects, including historic or prehistoric ruins, burial grounds, cemeteries, and ceremonial sites, notify and offer to consult with the tribe or tribes that have been identified as having cultural ties and affiliation with that geographic area

Policy OSRC-19m: Develop procedures for consulting with appropriate Native American tribes during the General Plan adoption and amendment process.

Policy OSRC-19n: Develop procedures for complying with the provisions of State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, if applicable, in the event of the discovery of a burial or suspected human bone. Develop procedures for consultation with the Most Likely Descendant as identified by the California Native American Heritage Commission, in the event that the remains are determined to be Native American.

4.5.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5;*

b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5; or,*

c) *Disturb any human remains, including those interred outside of dedicated cemeteries.*

PROJECTS IMPACTS AND MITIGATION MEASURES

a) Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?

The Project would remove the existing Chalk Hill Road bridge over Maacama Creek, which is an eligible historic structure under National Register Criterion C as an early example of an open-spandrel concrete arch bridge. No other structures within the Project APE were determined to be eligible for listing in the National Register of Historic Places, nor would any be directly impacted by the project. Mitigation Measure CUL-1 would be implemented, which contains measures for the County to record the historical significance of the bridge. Measures include creating a three-dimensional scan of the bridge and sharing the data with local historical groups, creating and presenting a public webinar on the Chalk Hill Road Bridge, and incorporating the 1915 construction plaque into the new bridge design. Suggestions for proposed mitigations made by the Landmarks Commission have been incorporated into Mitigation Measure CUL-1, including incorporating the plaque of the historic bridge into the new bridge design. Implementation of these measures would help reduce the impact to historical resources; however, removal of the historic bridge would still represent a ***significant and unavoidable*** impact of the Project.

Mitigation Measures

Mitigation Measure CUL-1. Chalk Hill Road Bridge Historic Recordation

Prior to commencement of any work that could adversely affect any characteristics that qualify the Chalk Hill Road Bridge as a historic property, the County shall create a three-dimensional scan of the bridge. The data shall be collected with a high-definition Terrestrial Laser Scanner, which will produce a complete point cloud of the bridge. This data shall be accurate to survey industry standards, and readily inserted into industry standard 3D modeling software. The data shall be made available to the following organizations: Bridgehunter.com, Historicbridges.org, Sonoma County Historical Society, and the Sonoma County Landmarks Commission. Additionally, the data shall be made available to the public via the designated DPI Project website.

The County, in collaboration with Caltrans District 4, shall develop a public webinar. The webinar will explore the history of the Chalk Hill Road Bridge and applicable themes. The webinar shall be delivered to the public and shall be made available via the designed DPI Project website.

The County shall ensure that the 1915 construction plaque on the bridge is removed prior to demolition of the old bride. The County, in consultation with the Sonoma County Landmarks Commission, shall incorporate the plaque into the replacement bridge design in an area visible to the public. If incorporating the plaque into the new signage is not feasible, the County shall offer the plaque to a local museum, group, or repository willing and capable of curating the plaque. If no repository has been identified within three months of the initial offer, the County may dispose of the plaque.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?

One archaeological resource has been previously documented within the APE; however, this resource is outside the ADI for Project work and would not be impacted by construction or operational activities. Although there are no other documented resources within the Project site, the APE is identified as having a high potential for buried archaeological resources. Ground-disturbing activities during construction could result in the discovery of unknown archaeological resources within the Project site, which is a potentially significant impact. Mitigation Measure CUL-1 would be implemented during Project construction, which requires that, if archaeological resources are found, all soil-disturbing work in the vicinity of the find shall stop until a significance evaluation of the find is made by a professional archaeologist. The archaeologist may recommend potential treatment methods which shall be implemented by the Lead Agency. With the implementation of Mitigation Measure CUL-1, the Project would not cause a substantial adverse change in the significance of an archaeological resource as defined by CEQA Guidelines Section 15064.5. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure CUL-2. Archaeological Resources

If buried materials are encountered during Project construction, all soil disturbing work shall be halted within the immediate vicinity of the discovery until a qualified archaeologist makes a significance evaluation of the find(s) pursuant to Section 106 of the NHPA (36CFR60.4). If the qualified archaeologist determines that the find is eligible for inclusion on the National or California Register, the archaeologist shall make recommendations for appropriate methods of treatment for the find, which shall be implemented by the lead agency. Potential treatment methods for resources may include, but would not be limited to, avoidance of the resource through changes in construction methods or project design or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. Any efforts shall be documented in a cultural resources report to be filed with the Northwest Information Center.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

There are no known human remains located within the Project site. However, ground-disturbing activities during construction have the potential to impact unknown human remains which may be buried beneath the Project site. Mitigation Measure CUL-2 would be implemented, which contains proper procedures that must be followed in the event of discovery of human remains on the Project site. With implementation of Mitigation Measure CUL-2, the Project would not disturb any human remains, including those interred outside of dedicated cemeteries. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure CUL-3: Human Remains

Work shall halt within 50 feet if human remains are uncovered during construction. The significance of the find shall be assessed by a qualified archaeologist, and the appropriate management shall be pursued. California law recognizes the need to Protect interred human remains, particularly Native American burials and items of cultural patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are

contained in California Health and Safety Code §§ 7050.5 and 7052 and PRC § 5097. If remains are uncovered, the lead agency and the County coroner shall be notified immediately. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code § 7050.5[b]). If the coroner determines that the remains are those of a Native American, the coroner must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code § 7050[c]). The lead agency and the professional archaeologist shall contact the Most Likely Descendent, as determined by the NAHC, regarding the remains. The Most Likely Descendant, in cooperation with the lead agency, shall determine the ultimate disposition of the remains and any associated artifacts.

4.6 Energy

This section describes the existing energy setting of the Project site, identifies associated regulatory requirements, analyzes potential impacts related to the inefficient, wasteful, and unnecessary consumption of any, and identifies mitigation measures as necessary to reduce Project impacts related to energy use.

4.6.1 Setting

Energy use is closely linked to environmental quality, as it can impact air quality and deplete natural resources. Generating electricity, primarily through the combustion of fossil fuels to power homes and vehicles, produces heat and emissions. Transportation-related energy consumption is influenced by vehicle fuel efficiency, the extent of public transportation options, travel mode choices (such as driving alone, carpooling, or using transit), and the total distance travelled. Additionally, energy is required for the construction, operation, and maintenance of infrastructure, as well as for residential land uses, which commonly rely on electricity and natural gas.

ENERGY SUPPLY

In 2022, the largest two sources of energy produced in California were crude oil (approximately 700 trillion Btu) and non-combustible renewables (approximately 380 Btu). Other sources of energy produced in California include natural gas, nuclear electric power, and wood and waste (U.S. Energy Information Association [EIA] 2022a). Sonoma County's energy is supplied from locally generated renewable sources such as hydro, solar, geothermal, and landfill gas, and from larger regional energy projects. Although Sonoma County has notable oil and gas production history, there is a growing focus on alternative energy sources, and there are no active oil fields remaining in the County. Sonoma County is also home to The Geysers, the largest geothermal field in the world, which contributes significantly to California's renewable energy production.

ENERGY CONSUMPTION AND SOURCES

Total energy consumption in the U.S. in 2023 was 93.59 quadrillion British thermal units (Btu) (U.S. EIA 2023). In 2023, petroleum provided 38 percent of that energy, with other sources coming from natural gas (approximately 36 percent), nuclear electric power (approximately 9 percent), coal (approximately 9 percent), and renewable energy (approximately 9 percent). On a per capita basis in 2022, California ranked the fourth lowest state in terms of total energy consumption (176.3 million Btu per capita), or about 38 percent less than the U.S. average per capita consumption of 284.4 million Btu per capita (U.S. EIA 2022b).

Electricity and Natural Gas

Most of the energy used in California comes from natural gas-fired power plants, which provided approximately 36 percent of the total electricity in 2022 (California Energy Commission [CEC] 2022). In 2022, California produced approximately 70 percent of the electricity it used and imported the rest from outside the state.

In 2022, Sonoma County consumed approximately 107 million therms of natural gas and approximately 2880 gigawatt-hours (GWh) of electricity (California Energy Commission [CEC] 2022). Sonoma Clean Power (SCP) and Pacific Gas and Electric Company (PG&E) work together to provide electricity throughout Sonoma County. SCP is the default power generation provider

that contracts with power generation plants to source clean and renewable energy. PG&E is responsible for physical delivery and billing of the electricity and also provides natural gas to the County.

Petroleum

Energy consumed by the transportation sector accounts for approximately 42.5 percent of California's total energy consumption, totaling approximately 2,917.3 trillion Btu in 2022 (U.S. Energy Information Administration 2022a). In 2022, California consumed 628 million barrels of petroleum, approximately 8.6 percent of the total annual petroleum consumption in the U.S (U.S. EIA 2022c). In 2022, petroleum-based fuels were used for approximately 98.1 percent of California's transportation activity (U.S. EIA 2022d). California's transportation sector consumed approximately 2,915.8 trillion Btu of petroleum-based energy in 2022 (U.S. EIA 2022d).

As shown in Table 4.6-1, approximately 216 million gallons of fuel were consumed in Sonoma County in 2023, of which approximately 85 percent was gasoline and 15 percent was diesel fuel (CEC 2023). This equates to approximately 0.59 million gallons of fuel per day or 1.2 gallons of fuel per person per day, based on a 2023 countywide population of 481,812 people (U.S. Census Bureau 2023).

Table 4.6-1. Annual and Daily Transportation Energy Consumption in Sonoma County

FUEL TYPE	2022 ANNUAL FUEL USE (MILLION GALLONS)	2022 DAILY FUEL USE (MILLION GALLONS)	2022 DAILY ENERGY USE (BILLIONS OF BTU)	2023 DAILY PER CAPITA ENERGY USE (THOUSANDS OF BTU)
Gasoline	184	0.50	60.1	124.7
Diesel	32	0.09	12.4	25.7
Total	216	0.59	72.5	150.4

Source: CEC 2018

According to the U.S. EIA, one gallon of gasoline is equivalent to approximately 120,214 Btu, while one gallon of diesel is equivalent to approximately 137,381 Btu (U.S. EIA 2024). Based on this formula, approximately 72.5 billion Btu in transportation fuel were consumed per day in 2023 in Sonoma County.

Alternative Fuels

The use of a variety of alternative fuels is encouraged through statewide regulations and plans in order to reduce petroleum-based fuel demand. Gasoline and diesel may be replaced, depending on the capability of the vehicle, with alternative fuels including the following (California Air Resources Board [CARB] 2025):

- *Hydrogen* is being explored for use in combustion engines and fuel cell electric vehicles. Hydrogen is a clean fuel that, when consumed in fuel cell, only produces water as a byproduct. Hydrogen fuel cell vehicles are zero-emission and run on compressed hydrogen fed into a fuel cell stack that produces electricity to power the vehicle.
- *E85 ethanol* is a nominal blend of 85 percent ethanol and 15 percent gasoline that is an alternative fuel for automobiles. CARB has adopted specifications for E85 Ethanol in motor vehicles.
- *Methanol* is a naturally occurring alcohol produced through anaerobic bacterial fermentation. Today, methanol is being produced via multiple industrial chemical

processes, the most common involving natural gas as a feedstock although coal and biomass are alternatives. CARB has adopted specifications for M85 Methanol in motor vehicles.

- *Compressed natural gas* is a gasoline and diesel fuel alternative consisting primarily of methane and is created by methanogenic organisms in landfills. The gas is extracted from the source and compressed to a high pressure where it can be stored in a vehicle fuel tank. Individuals interested in converting their gasoline or diesel fueled vehicles to operate with compressed natural gas must ensure that the alternative fuel retrofit systems have been certified by CARB.

ENERGY AND FUEL EFFICIENCY

While population growth and limited access to mass transit are contributing to increased demand for gasoline and diesel, this rise can be partially mitigated through improvements in fuel efficiency. Strategies such as promoting infill development and transit-oriented growth (as encouraged by SB 375, the Sustainable Communities and Climate Protection Act of 2008), enhancing vehicle fuel efficiency, and gradually transitioning to a newer, more efficient vehicle fleet can all help reduce overall fuel consumption. Additionally, rising gasoline prices may further contribute to a decline in fuel demand across the state.

4.6.2 Regulatory Setting

FEDERAL REGULATIONS

Energy Policy Conservation Act and Corporate Average Fuel Economy

The Energy Policy and Conservation Act of 1975 established the Corporate Average Fuel Economy (CAFE) standards to promote nationwide fuel efficiency and reduce oil consumption. Under this legislation, the National Highway Traffic Safety Administration (NHTSA), part of the U.S. Department of Transportation, is tasked with updating existing standards and setting new fuel economy requirements for vehicles. The CAFE program monitors compliance by assessing each vehicle manufacturer's average fuel economy for the vehicles they produce for the U.S. market.

National Energy Policy Act of 1992

The National Energy Policy Act of 1992 (EPACT92) promotes energy efficiency and the adoption of alternative fuels through a range of programs and incentives. It mandates that certain federal, state, and local government agencies, along with some private fleet operators, include a specified percentage of light-duty alternative fuel vehicles in their fleets annually. To support this transition, EPACT92 offers financial incentives such as federal tax deductions to help offset the additional cost of purchasing alternative fuel vehicles. The Act also directs states to explore and implement various incentive programs aimed at encouraging the use of these vehicles.

Energy Policy Act of 2005

The Energy Policy Act of 2005 offers renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act is designed to help reduce U.S. dependence on oil and improve vehicle fuel economy. The Act expands the production of renewable fuels, thus reducing dependence on oil and responding to global climate change. Specifically, the Act sets a mandatory Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel in 2022 and sets a national fuel economy standard of 35 miles per gallon by 2020 – an increase in fuel economy standards of 40 percent over those in 2007.

Safer Affordable Fuel-Efficient Vehicles Rule

The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, finalized on March 31, 2020, establishes annual increases in fuel economy and carbon dioxide emission standards of 1.5 percent for model years 2021 through 2026. These requirements apply to both passenger vehicles and light-duty trucks and represent a less aggressive approach compared to the 2012 standards, which called for roughly 5 percent annual improvements. By 2026, the rule is expected to lead to an industry-wide average fuel economy of 40.4 miles per gallon.

STATE REGULATIONS

Warren-Alquist Act

The Warren-Alquist Act of 1975 created the California Energy Resources Conservation and Development Commission, which is now known as the California Energy Commission (CEC). This legislation set a state policy aimed at minimizing inefficient, uneconomical, and excessive energy use through various strategies. Meanwhile, the California Public Utilities Commission (CPUC) oversees privately owned utilities across the energy, telecommunications, rail, and water sectors.

Assembly Bill 2076: Reducing Dependence on Petroleum

In accordance with Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000; Public Resources Code Sections 25720–25721), the CEC and the CARB jointly released the *Reducing California's Petroleum Dependence* report in 2003. This report outlines key strategies to reduce dependence on petroleum, including increasing alternative fuels to account for 20 percent of on-road fuel use by 2020 and 30 percent by 2030, enhancing vehicle fuel efficiency, and lowering per capita vehicle miles travelled (VMT). AB 2076 also sets a performance-based target to reduce petroleum demand to 15 percent below 2003 levels. Following the CEC's 2003 and 2005 Integrated Energy Policy Reports, the Governor tasked the CEC with leading the development of a long-term strategy to expand alternative fuel use in the state.

Integrated Energy Policy Report

SB 1389 (Chapter 568, Statutes of 2002) mandates that the CEC regularly assess and forecast all facets of the energy sector—including supply, production, transportation, delivery, distribution, demand, and pricing. These evaluations are intended to guide the development of energy policies that promote resource conservation, environmental protection, energy reliability, economic growth, and public health and safety.

California Renewables Portfolio Standard Program

Signed into law in 2018, the California Renewables Portfolio Standard (SB 100) required that 60 percent of the state's electricity retail sales come from renewable sources by 2030. The law also sets a long-term goal for the state to transition to 100 percent carbon-free electricity by 2045.

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) mandates that 50 percent of the electricity sold to retail customers annually must come from eligible renewable energy sources by December 31, 2030. In addition, the Act sets a goal to double energy efficiency savings in both electricity and natural gas use for retail customers through enhanced efficiency measures and conservation efforts by the same target date.

Assembly Bill 1493: Reduction of Greenhouse Gas Emissions

Assembly Bill 1493 (Chapter 200, Statutes of 2002), commonly known as the "Pavley bill," amended sections 42823 and 43018.5 of the California Health and Safety Code and directed the CARB to develop regulations aimed at achieving the maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial personal vehicles. To implement these regulations, California was required to seek a waiver under the federal Clean Air Act. Although the U.S. Environmental Protection Agency (EPA) initially denied the waiver in 2008, it was ultimately granted in June 2009. Following this, CARB adopted amendments in September 2009 to apply the Pavley standards to new passenger vehicles for model years 2009 through 2016.

Energy Action Plan

California's first Energy Action Plan (EAP), introduced in 2003, was developed in response to instability in the state's energy markets. It marked the first formal collaboration among the CPUC, the CEC, and the now-defunct Consumer Power and Conservation Financing Authority to establish a unified strategy for meeting the state's electricity and natural gas needs. This joint effort prioritized a cohesive energy policy that also considered environmental impacts. In October 2005, the release of EAP II expanded on the original plan by addressing new policy areas, including climate change, transportation-related energy use, and energy research and development. The CEC later adopted an update to EAP II in February 2008, which further built on prior strategies and aligned the state's energy actions with global climate change concerns.

Assembly Bill 1007: State Alternative Fuels Plan

Assembly Bill 1007 (Chapter 371, Statutes of 2005) directed the CEC to develop a statewide plan to expand the use of alternative fuels. In collaboration with the CARB and with input from various state, federal, and local agencies, the CEC produced the State Alternative Fuels Plan (SAF Plan). The plan outlines strategies for increasing the use of non-petroleum alternative fuels while minimizing costs and maximizing the economic benefits of in-state fuel production. It evaluates a range of alternative fuel options and proposes fuel portfolios designed to help California meet its goals for reducing petroleum dependence, cutting greenhouse gas emissions, expanding alternative fuel use, and boosting in-state biofuel production - all while protecting public health and environmental quality.

Bioenergy Action Plan, Executive Order S-06-06

Executive Order (EO) S-06-06, issued on April 25, 2006, sets clear targets for the production and use of biofuels and biopower in California, while directing state agencies to collaborate on advancing biomass programs that also prioritize environmental protection and mitigation. The EO establishes specific goals for bioenergy production, including a target for California to produce at least 20 percent of its biofuels by 2010, 40 percent by 2020, and 75 percent by 2050, covering fuels such as ethanol and biodiesel derived from renewable resources. Additionally, EO S-06-06 sets a target for the state to increase its use of biomass electricity. The 2011 Bioenergy Action Plan identifies key barriers to achieving these goals and recommends actions to overcome them, supporting California's clean energy, waste reduction, and climate protection objectives. The updated 2012 Bioenergy Action Plan provides a more detailed roadmap for achieving the following goals:

1. Boost the environmentally and economically sustainable production of energy from organic waste.
2. Foster the development of diverse bioenergy technologies, including local electricity generation, combined heat and power systems, renewable natural gas, and renewable liquid fuels for transportation and fuel cell applications.
3. Create job opportunities and stimulate economic growth, particularly in rural areas of the state.
4. Reduce fire risk, improve air and water quality, and minimize waste.

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The Sonoma County General Plan Open Space and Resource Conservation (OSRC) Element includes the following goals, objectives, and policies related to energy:

> **Goal OSRC-14:** Promote energy conservation and contribute to energy demand reduction in the County.
>
> **Objective OSRC-14.2:** Encourage County residents and businesses to increase energy conservation and improve energy efficiency.
>
> **Policy OSRC-14d:** Support project applicants in incorporating cost effective energy efficiency that may exceed State standards.
>
> **Goal OSRC-15:** Contribute to the supply of energy in the County primarily by increased reliance on renewable energy sources.
>
> **Objective OSRC-15.2:** Promote the use of renewable energy and distributed energy generation systems and facilities in new development in the County.

4.6.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or*

b) *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency*.

APPROACH TO IMPACT ANALYSIS

Impacts in this section are primarily focused on consumption of energy from project construction and operation. Physical impacts associated with the use of energy are discussed in *Section 4.3, Air Quality* and *Section 4.8, Greenhouse Gas Emissions*. Construction energy demands accounts for anticipated energy consumption during the construction stage of the proposed Project, including demolition of the existing bridge. Operational energy demand accounts for the anticipated energy consumption once the construction stage has finished.

PROJECT IMPACTS AND MITIGATION MEASURES

a) *Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

Construction

Construction of the Project would result in a short-term increase in energy consumption due to the use of gasoline and diesel fuels for heavy-duty construction equipment and vehicles. The use of construction equipment would result in a temporary increase in fuel consumption in the Project area relative to pre-Project conditions. As discussed in *Section 4.3, Air Quality*, construction emissions would not exceed the Bay Area Air District's thresholds of significance for regional air quality.

Energy use during construction would be temporary, and construction equipment used would be typical of similar-sized infrastructure projects in the region. Construction contractors would be required to follow the provisions outlined in CCR Title 13, sections 2449 and 2485, which prohibit diesel-fueled commercial and off-road vehicles from idling for more than five minutes, thereby minimizing unnecessary fuel consumption. Additionally, construction equipment would adhere to the U.S. EPA Construction Equipment Fuel Efficiency Standards, such as Tier 4 requirements, found in 40 Code of Federal Regulations Parts 1039, 1065, and 1068, to reduce inefficient fuel use. Electrical power needed for demolition and construction activities would be sourced from the existing local electricity providers (SCP and PG&E).

In general, demolition and construction activities are not expected to negatively affect electricity supply or infrastructure. The use of fuel-efficient equipment that complies with both state and federal regulations will ensure that energy consumption is minimized and efficient. Furthermore, to maintain cost efficiency, contractors would avoid unnecessary or wasteful fuel consumption. As a result, demolition and construction activities will not cause significant environmental impacts due to inefficient energy use. The impact would be ***less than significant***.

Operation and Maintenance

Other than the fuel used by vehicles using the new bridge, energy demand during operation of the Project will primarily be limited to ongoing maintenance needs, which would be anticipated to be less extensive or frequent than the maintenance requirements associated with the existing bridge. As discussed in *Section 4.17, Transportation*, the replacement of the existing bridge would

not result in increased VMT. As a result, the operational energy demand of the Project will not increase, and any associated impacts would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The Project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency. The Sonoma County General Plan contains goals, objectives, and policies aimed at conserving energy and promoting the use of renewable energy sources over non-renewable sources. As discussed above in Impact a), the Project would result in a temporary, short-term increase in energy consumption due to the use of gasoline and diesel fuels for construction equipment and vehicles. This short-term increase in energy demand would be similar to the demand generated by other infrastructure and development projects in the county. This use of energy would not conflict with any goals, objectives, or policies of the Sonoma County General Plan, nor would it interfere with any state or federal regulations pertaining to energy conservation or efficiency. As discussed above in Impact a), construction equipment would be required to adhere to the U.S. EPA's Construction Fuel Efficiency Standards. Furthermore, contractors would avoid unnecessary or wasteful fuel consumption in order to maintain cost efficiency. As such, construction of the Project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency. The impact would be ***less than significant***.

Energy use during operation of the Project would be limited to the gasoline and diesel fuel needed for any bridge maintenance work. Due to the state of the existing bridge, the new bridge would require much less maintenance work, which means that less energy would be used during operation. Therefore, operation of the Project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

4.7 Geology and Soils

This section describes the existing setting of the Project site as it relates to geology and soils, identifies associated regulatory requirements, analyzes potential impacts related to geology and soils, and identifies mitigation measures as needed for implementation of the proposed Project.

4.7.1 Setting

REGIONAL GEOLOGY

The Project site is located in the Coast Ranges Geomorphic Province, one of the eleven geomorphic provinces in California. The Coast Ranges are northwest-trending mountain ranges, ranging from approximately 2,000 to 6,000 feet above sea level, and valleys. The ranges are bounded by the Pacific Ocean to the west and the Great Valley to the east and are generally composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern ranges are characterized by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border includes strike-ridges and valleys in Upper Mesozoic Strata. In several places, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma, and Clear Lake volcanic fields (California Geological Survey [CGS] 2022).

LOCAL GEOLOGIC SETTING

Soils

According to the Natural Resource Conservation Service (NRCS), soils within the Project area include the following (NRCS 2019):

- Laniger Loam, 5 to 9 percent slopes
- Laniger loam, 15 to 30 percent slopes
- Laniger loam, 30 to 50 percent slopes
- Haire clay loam, 0 to 9 percent slopes
- Cortina very gravelly loam, 0 to 2 percent slopes
- Riverwash

Soils within the Project site are shown in Figure 4.7-1.

Seismic Hazards

Sonoma County is located in the seismically active region of Northern California. The entire region is generally subject to risks associated with earthquakes and fault rupture. Earthquakes most commonly occur along geologic faults that are planes of weakness or fractures along which rocs have been displaced. Faults pose hazards primarily due to surface fault rupture and seismic ground shaking. Surface rupture occurs when movement along a fault reaches the Earth's surface, which can be highly destructive to structures built directly across active fault traces. However, the extent of surface rupture damage is usually confined to a narrow zone along the fault, whereas ground shaking from an earthquake can affect a much broader area.

Faults are categorized as active, potentially active, and inactive. An active fault is one that has experienced movement during the Holocene epoch (approximately the last 11,000 years). Potentially active faults are those with movement during the Quaternary period (within the last

1.8 million years), while faults that have not moved in the last 1.8 million years are considered inactive.

Most faults in Sonoma County are associated with the San Andreas Fault system, which runs along much of California and marks the boundary between the Pacific and North American tectonic plates. The nearest active faults to the project area include the Maacama fault zone (1.25 miles east), the Rodgers Creek fault zone (2.75 miles southwest), and the Redwood Hill fault zone (five miles south). These faults are shown in Figure 4.7-2.

Surface Rupture

Surface fault rupture occurs when the area of a fault that breaks during an earthquake intersects with the ground surface, resulting in visible displacement. This displacement happens when the ground on one side of the fault moves relative to the other. Structures located within this rupture zone are particularly vulnerable, as the sudden movement can cause significant damage. Designing buildings to withstand such rapid and large-scale ground shifts is generally neither structurally practical nor economically viable. The amount of surface displacement caused by an earthquake can vary widely from just a few inches to several tens of feet.

Ground Shaking

Ground shaking is the primary cause of structural damage during earthquakes. The level of shaking experienced at a given location depends on several factors, including the earthquake's magnitude, the distance from the epicenter, and the geological conditions between the epicenter and the site. Areas underlain by loosely consolidated soils, such as alluvium, and those located near a ruptured fault are likely to experience more intense ground motion, especially during large seismic events.

Sonoma County has historically experienced strong ground shaking from major earthquakes due to its location in seismically active Northern California and is expected to be subject to similar seismic activity in the future.

Liquefaction and Lateral Spreading

Liquefaction primarily occurs in relatively loose, saturated, cohesionless soils that lose their strength and become incapable of supporting the weight of overlying soils or structures when subject to earthquake stresses. Liquefaction occurs when three general conditions exist: 1) shallow groundwater within the top 50 feet of the ground surface; 2) low-density non-plastic soils; and 3) high-intensity ground motion. The Project site is mapped as having a moderate to very high susceptibility to liquefaction based on Open File Report 06-1037. The Association of Bay Area Governments Earthquake and Hazards Program Map indicates that the site liquefaction hazard level has a very high susceptibility (Brunsing Associates, Inc. 2021).

Lateral spreading is generally caused by liquefaction of marginally stable soil underlying gently to steeply inclined slopes. When this occurs, the saturated soils move toward an unsupported face, such as an incised river channel or body of water. Due to the proximity of liquefiable soils to the creek channel, lateral spreading is a design consideration for the Project.

Landslides and Slope Stability

Slope Stability

During the geological field investigation, borings revealed landslide debris made up of partially cemented blocks and loose material from Sonoma Volcanics tuff, overlying the on-site bedrock. This landslide debris is exposed in the creek channel near the existing bridge and nearby road

cuts. According to the Preliminary Foundation Report, the tuff was deposited from the ridge east of the project site during the 1906 earthquake along the San Andreas Fault. There are no landslides in the bridge vicinity, except a small creek bank slip-out and a remanent landslide from the 1906 earthquake east of the existing bridge. The landslide east of the existing bridge along Young Road still shows signs of historic movement, such as scarps, slope bulges, undulations, and depressions. The direction of landslide movement is to the north, towards the Maacama Creek channel (Brunson Associates Inc. 2021).

According to the Project Preliminary Foundation Report, the slopes within the creek channel supporting and adjacent to the existing bridge abutments are stable and show no evidence of sloughing or current landsliding. Small sloughs were observed in the slopes near the proposed locations of the new bridge abutments.

Expansive Soils

Expansive soils are those that possess a "shrink-swell" characteristic, which is a change in volume caused by expansion and contraction. This typically occurs in fine-grained clay sediments from the process of wetting and drying. Damage caused by expansive soils is typically structural damage that occurs over a long period of time, usually due to inadequate soil and formation engineering or the placement of structures on expansive soils.

Soil Erosion

Erosion is the process by which soil is displaced by water or wind. Several factors influence the potential for erosion, including rainfall intensity, wind strength, slope steepness and length, and the presence and type of vegetative cover. Depending on these factors, erosion can occur gradually or accelerate rapidly. Soil characteristics also play a role in determining susceptibility to erosion. The removal of vegetation or other protective ground cover can lead to significant soil loss, resulting in increased sedimentation and pollution in nearby streams, lakes, and estuaries. Construction activities are one of the primary contributors to erosion. In Sonoma County, areas of particular concern include steep vineyard hillsides, overgrazed rangelands, and stream corridors experiencing severe bank erosion.

PALEONTOLOGICAL RESOURCES

Paleontological resources, commonly known as fossils, are the preserved remains or traces of prehistoric life. These resources are typically found in layered sedimentary rock formations, and their distribution is influenced by the geologic and sedimentary history of the rock units in which they are embedded. Fossils are often distributed irregularly and unpredictably within these formations. While it is generally not possible to predict the presence of a fossil at a specific site, the potential for encountering scientifically significant paleontological resources can be assessed based on the characteristics of the geologic units present. This allows for an evaluation of potential impacts and the development of appropriate mitigation measures should such resources be discovered during construction activities.

Vertebrate fossil localities are generally considered more scientifically significant than invertebrate ones, particularly when they include microvertebrate fossil assemblages. The identification of new vertebrate fossil sites can contribute valuable insights into the geographic distribution of species, their geological age, evolutionary traits, depositional settings, and other key research topics. Because vertebrate fossils are less common than those of invertebrates or plants, geologic units with the potential to contain them are regarded as highly sensitive.

The Society of Vertebrate Paleontology (SVP) provides standards for assessing and managing potential impacts to paleontological resources in its 2010 publication *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*. According to SVP guidelines, sedimentary rock formations can be classified as having high, low, undetermined, or no potential for yielding scientifically important nonrenewable paleontological resources. These classifications are based on whether such rock units are known to contain, or likely contain, vertebrate fossils or significant invertebrate remains. Significant paleontological resources include fossils or fossil groups that are rare, distinctive, or important in terms of taxonomy, stratigraphy, or regional distribution.

The paleontological sensitivity of the Project site has been evaluated based on these SVP (2010) criteria, as outlined below.

High Resource Potential

Rock units from which vertebrate fossils or scientifically significant invertebrate, plant, or trace fossils have previously been recovered are considered to have high potential for containing additional important paleontological resources. This classification generally includes sedimentary formations, certain volcaniclastic deposits such as ash or tephra layers, and some low-grade metamorphic rocks that have been shown to contain valuable fossils across their geographic extent. It also includes sedimentary rock units that are suitable for fossil preservation based on their age or composition, such as fine-grained fluvial sandstones, carbonate rich paleosols, cross bedded point bar deposits, and fine-grained marine sandstones from the middle Holocene or older.

A high potential rating reflects both the likelihood that a unit may yield abundant or significant fossil remains, whether vertebrate, invertebrate, plant, or trace, and the scientific importance of those fossils for advancing understanding in areas such as taxonomy, evolutionary history, ancient ecosystems, fossil preservation, geologic dating, or stratigraphic relationships. Rock units that contain organic material older than the late Holocene, including deposits associated with animal nests or middens, or those that may preserve new vertebrate fossils, tracks, or other trace evidence, are also classified as having high potential.

Undetermined Resource Potential

Rock units with limited available data regarding their fossil content, geologic age, or depositional setting are classified as having undetermined paleontological potential. To assess whether these units are likely to yield significant fossil resources, additional study is required. This includes a field evaluation by a qualified professional paleontologist to establish the resource sensitivity. In situations where subsurface data are lacking, paleontological potential may be assessed through targeted excavations that expose representative portions of the subsurface stratigraphy. This evaluation is necessary before developing any appropriate mitigation measures.

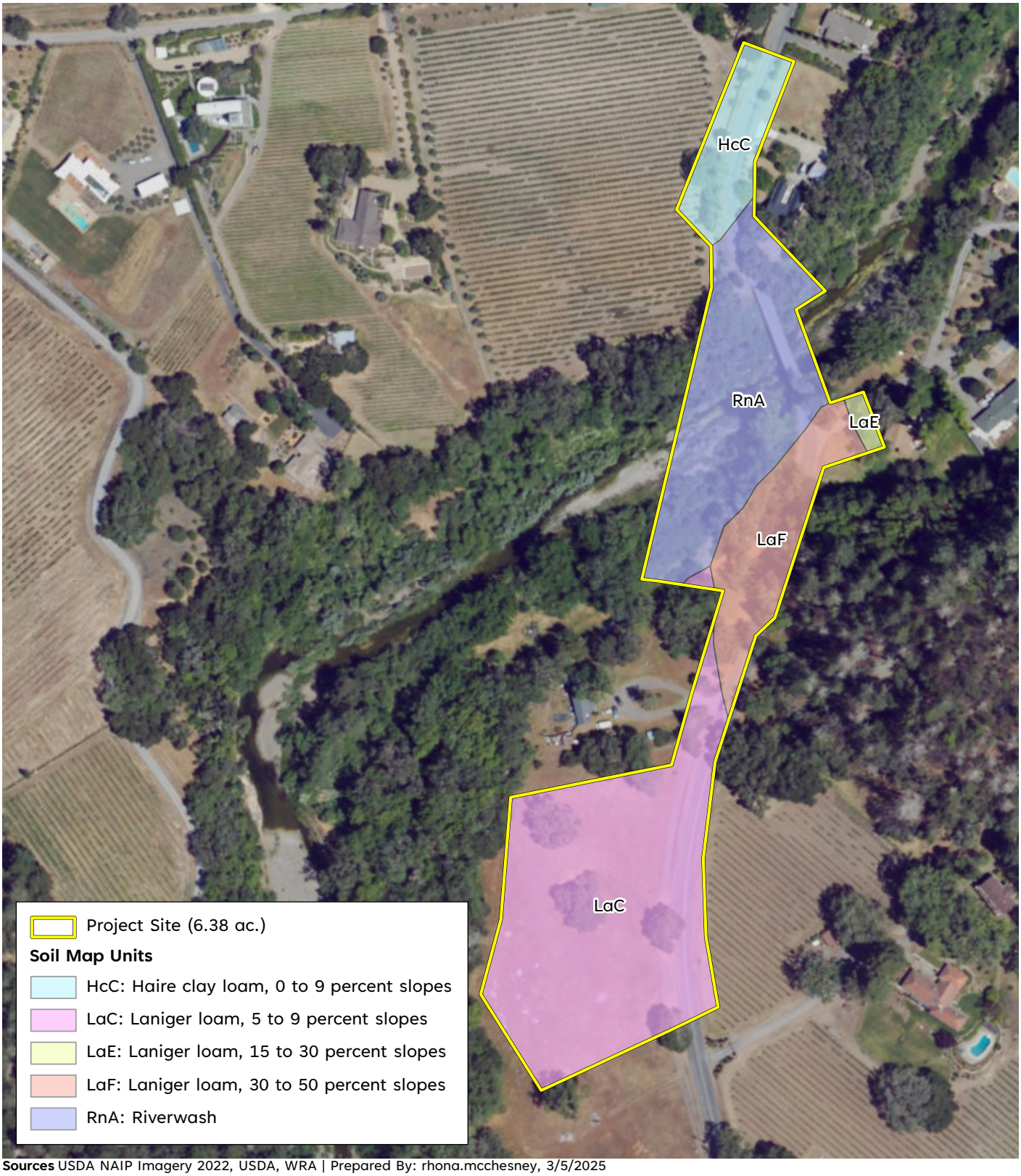
Low Resource Potential

Paleontological literature and field investigations conducted by a qualified professional paleontologist may indicate that certain rock units have a low potential for producing significant fossil material. These formations are typically underrepresented in museum collections or are generally recognized by the scientific community as rarely preserving fossils (for example, basalt flows or very recent colluvial deposits). In such cases, the occurrence of fossils is considered

uncommon. As a result, rock units with low paleontological potential generally do not require specific mitigation measures to protect fossil resources.

No Resource Potential

Certain geologic formations, such as high-grade metamorphic rocks (e.g., gneiss and schist) and intrusive igneous rocks (e.g., granite and diorite), are considered to have no potential to contain significant paleontological resources. Because these rock types do not preserve fossils, they do not warrant paleontological resource protection or mitigation measures during project activities.



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: Figure XX. Soils within the Project Site

Sources USDA NAIP Imagery 2022, USDA, WRA | Prepared By: rhona.mcchesney, 3/5/2025

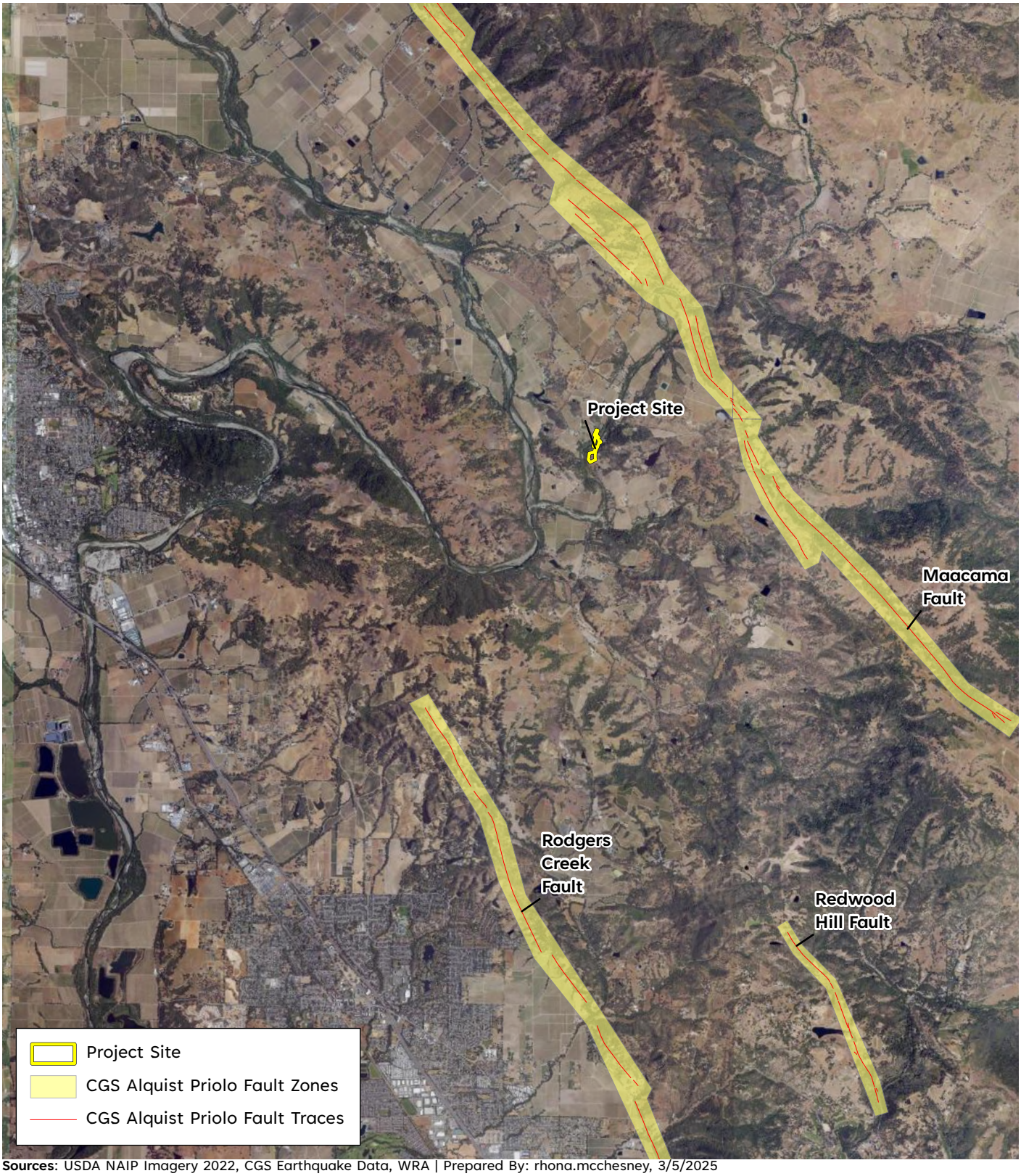
Figure 4.7-1. Soils within the Project Site

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 250 500 Feet

N

wra Environmental Consultants



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: Figure XX. Earthquake Zones of Required Investigation

Sources: USDA NAIP Imagery 2022, CGS Earthquake Data, WRA | Prepared By: rhona.mcchesney, 3/5/2025

Figure 4.7-2. Earthquake Zones of Required Investigation

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 0 15 Miles

N

wra Environmental Consultants

4.7.2 Regulatory Setting

FEDERAL REGULATIONS

Clean Water Act

The Clean Water Act (CWA), originally enacted as the Federal Water Pollution Control Act of 1972, was established to restore and preserve the chemical, physical, and biological integrity of U.S. waters. Under the CWA, states are required to develop standards to protect and enhance water quality by regulating both point and non-point source discharges into surface waters. These discharges are managed through the National Pollutant Discharge Elimination System (NPDES) permit program, as outlined in Section 402 of the CWA. In California, the NPDES program is overseen by the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs). In Sonoma County, the Sonoma Creek and Petaluma River watersheds fall under the jurisdiction of the San Francisco Bay RWQCB, while the rest of the county is regulated by the North Coast RWQCB.

Construction projects within the County that disturb more than one acre are required to obtain NPDES coverage under the California General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). This permit mandates the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which outlines the best management practices (BMPs) that will be used to control stormwater runoff and minimize soil erosion during construction.

STATE REGULATIONS

California Building Code

Title 24, Part 2 of the California Building Code (CBC) provides building codes and standards for the design and construction of structures in the state. The 2022 CBC incorporates the 2021 International Building Code with the addition of more extensive structural seismic provisions. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Ac was enacted in 1972 in response to the devastating 1971, magnitude 6.6 San Fernando earthquake. The Act was designed to reduce the risk of damage caused by surface fault rupture across California. Its primary goal is to protect public safety by prohibiting most structures intended for human occupancy from being built directly over active fault traces that pose a surface rupture hazard. The Act classifies faults into three categories based on age and activity: active (Historic and Holocene), potentially active (Late Quaternary and Quaternary), and inactive (pre-Quaternary).

The Act includes two main provisions: (1) restricting the placement of most habitable structures across active fault traces, and (2) requiring geological and seismic investigations for most proposed developments within 1,000 feet of designated Earthquake Fault Zones. The Earthquake Fault Zones are areas identified by the State Geologist as having the potential for surface rupture along a fault.

The proposed Project does not involve a structure intended for human occupancy and is located more than 1,000 feet outside of any designated Alquist-Priolo Earthquake Fault Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act, enacted in 1990 following the magnitude 6.9 Loma Prieta earthquake of October 17, 1989, aims to protect public health and safety by identifying and mitigating seismic hazards. Under this Act, the California Geological Survey (CGS) is responsible for mapping Seismic Hazard Zones, which identify areas at risk for hazards such as liquefaction, landslides, amplified ground shaking, and inundation from tsunamis or seiches. State and local agencies, including cities and counties, are required to incorporate these maps into their land-use planning and permitting processes. The Act also mandates that site-specific geotechnical investigations be conducted before approving most urban development projects within these designated hazard zones. CGS is responsible for maintaining and updating the official hazard maps.

California Public Resources Code

Section 5097.5 of the Public Resources Code states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

In this section, "public lands" refers to those lands owned by, or under the jurisdiction of, the state or any city, county, district, authority, or public corporation, or any agency thereof. Accordingly, public agencies are required to comply with PRC Section 5097.5 for their own activities, including construction and maintenance, and for permit actions undertaken by others.

REGIONAL AND LOCAL REGULATIONS

Refer to *Section 4.10, Hydrology and Water Quality*, for a discussion of various water quality related permits and requirements, including the Municipal Separate Storm Sewer System Permit, Standard Urban Storm Water Mitigation Plan, and Low Impact Development Manual.

Sonoma County Code of Ordinances

Established in 1993, the Geologic Hazard Combining District (G District) was incorporated into Sonoma County's Zoning Regulations (Chapter 26) to help minimize risks to people and property from geologic hazards such as earthquakes and landslides. The G District specifically applies to areas within the Alquist-Priolo Earthquake Fault Zone. While all uses allowed in the underlying zoning districts remain permitted, the placement of structures intended for human occupancy—or projects as defined by the Alquist-Priolo Act—is prohibited across active fault traces or within 50 feet of such faults. Development within the G District requires a geologic report to assess and address site-specific hazards. The Project site is not located within a designated G District.

Sonoma County General Plan

The General Plan Public Safety Element and Open Space and Resource Conservation Element contain the following relevant policies related to geologic hazards and paleontological resources:

> **Policy PS-1a:** Continue to use all available data on geologic hazards and related risks from the appropriate agencies.

Policy PS-1b: Continue to use studies of geologic hazards prepared during the development review process.

Policy PS-1e: Continue to implement the "Geologic Hazard Area" combining district which establishes regulations for permissible types of uses and their intensities and appropriate development standards.

Policy PS-1f: Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards areas shown on Public Safety Element hazard maps and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels.

Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.

Policy PS-1g: Prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Special Studies Zones Act and related Administrative Code provisions) within 50 feet of the surface trace of any fault.

Policy PS-1j: Encourage strong enforcement of State seismic safety requirements for design and construction of buildings and facilities subject to State and Federal standards such as bridges, dams, power plants, hospitals and schools.

Policy PS-1k: Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.

Policy OSRC-11b: Include erosion control measures for any discretionary project involving construction or grading near waterways or on lands with slopes over 10 percent.

Policy OSRC-11d: Require a soil conservation program to reduce soil erosion impacts for discretionary projects that could increase waterway or hillside erosion. Design improvements such as roads and driveways to retain natural vegetation and topography to the extent feasible.

Policy OSRC-11e: Retain natural vegetation and topography to the extent economically feasible for any discretionary project improvements near waterways or in areas with a high risk of erosion as noted in the Sonoma County Soil Survey.

Policy OSRC-11g: Continue to enforce the Uniform Building Code to reduce erosion and slope instability problems.

Policy OSRC-19j: Develop an archaeological and paleontological resource protection program that provides:

1. Guidelines for land uses and development on parcels identified as containing such resources.
2. Standard project review procedures for protection of such resources when discovered during excavation and site disturbance 3. Educational materials for the building industry and the general public on the identification and protection of such resources.

Sonoma County Multi-Jurisdictional Hazard Mitigation Plan

The Sonoma County Multi-Jurisdictional Hazard Mitigation Plan, adopted in 2021, evaluates the County's vulnerability to a range of hazards, including those related to geology and soils, such as landslides, earthquakes, and liquefaction. The Plan outlines a mitigation strategy consisting of goals, objectives, and actions to be pursued over a five-year period, and is designed to identify practical opportunities for reducing risk and enhancing resilience. Among the proposed measures to address seismic hazards are structural evaluations and retrofitting of County buildings, implementation of the Earthquake Resistant Bracing System Program, and the seismic retrofit of bridges throughout the County.

4.7.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:*

   i) *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;*

   ii) *Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Strong seismic ground shaking;*

   iii) *Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Seismic-related ground failure, including liquefaction;*

   iv) *Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Landslides;*

b) *Result in substantial soil erosion or the loss of topsoil;*

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;*

d) *Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code, creating substantial direct or indirect risks to life or property;*

e) *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or,*

f) *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.*

APPROACH TO IMPACT ANALYSIS

Geology and Soils

The impact analysis relies on review of databases and literature that contain information about geologic and soil conditions on the project site, and the findings of the Preliminary Foundation Report prepared by Brunsing Associates, Inc. in January 2021. The preliminary foundation study included a field reconnaissance of the project site, subsurface exploration, and laboratory testing of on-site soils. Eleven exploratory test borings throughout the project site were advanced to depths between one to 99 feet below the ground surface. Laboratory tests were performed on soil and bedrock samples obtained during the subsurface exploration to determine the moisture content, density, grain size, resistance value, and other characteristics of the samples.

Paleontological Resources

Before the uniqueness of a paleontological resource can be evaluated, the resource must first be identified or recovered through appropriate methods. While CEQA does not specifically define what constitutes a unique paleontological resource or site, the SVP provides a definition for significant paleontological resources in the context of environmental review. According to SVP guidelines, significant paleontological resources are defined as "Fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are typically older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years)" (SVP 2010).

For the purposes of this EIR, any Project activity that could result in the destruction of scientifically significant paleontological resources, as defined above, would be considered a significant environmental impact.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

As discussed in the *Regulatory Setting* section above, Sonoma County applies the G District to areas located within an Alquist-Priolo Earthquake Fault Zone. The Project site is not within the G District. Therefore, the Project would not directly or indirectly cause substantial adverse effects involving rupture of a known earthquake fault. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

ii) Strong seismic ground shaking?

All of Sonoma County is subject to seismic shaking that would result from earthquakes along the various faults in the region. The nearest faults to the Project site are the Maacama, Healdsburg,

and Mark West Creek faults. It is not possible to predict when a seismic event will occur, nor is it possible to mitigate potential impacts of ground shaking. As stated in *Section 2.0, Project Description,* one of the objectives of the Project is to satisfy the requirements of California's Local Bridge Seismic Retrofit Program to protect the traveling public from earthquake related hazards. The new bridge would be designed in accordance with Caltrans Seismic Design Criteria, which will reduce hazards to people and property resulting from strong seismic ground shaking. Project conditions of approval would require that bridge designs for construction meet all standard seismic and soil test/compaction requirements. Therefore, the Project would not cause substantial adverse effects associated with strong seismic ground shaking. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

iii) Seismic-related ground failure, including liquefaction?

As discussed in the *Seismic Hazards* section above, the Project site is within an area of moderate to high liquefaction susceptibility. The Project would replace an existing bridge that is susceptible to seismic hazards, with a new bridge built to current seismic standards that could better withstand hazards associated with seismic-related ground failure, including liquefaction and lateral spreading. As described above in Threshold a, ii), the new bridge would be designed in accordance with Caltrans Seismic Design Criteria in order to satisfy the requirements of California's Local Bridge Seismic Retrofit Program. The Project has been designed based on the recommendations of the Preliminary Foundation Report, which includes recommendations for foundations; abutments and retaining walls; approach fill and settlement; excavation stability and temporary slopes; construction dewatering; fill materials, placement, and compaction; and site drainage. These recommendations account for the suitability of on-site soils for construction of the project; therefore, compliance with the recommendations would ensure that no significant impact of the project would result from seismic-related ground failure. The impact would be ***less than significant***.

iv) Landslides?

Structures that would be built on steep slopes could be exposed to an existing risk of landslide or if improperly constructed, could exacerbate existing landslide conditions which are located in areas vulnerable to landslide hazard. Aside from the banks of Maacama Creek, there are no steep slopes located within or near the Project site. The findings of the Preliminary Foundations Report indicated that the slopes within the creek channel supporting and adjacent to the bridge abutments are stable and show no evidence of sloughing or current landsliding. However, the proposed southern abutment location is underlain by landslide debris from the 1906 earthquake along the San Andreas Fault. Another large earthquake on the San Andreas, Maacama, Healdsburg, or some other nearby active fault could reactivate the large dormant landslide. As described above in Threshold a) ii), the Project has been designed in accordance with Caltrans Seismic Design Criteria and the recommendations of the Preliminary Foundations Report. These recommendations account for the suitability of on-site geological conditions for construction of the Project; therefore, compliance with the recommendations would ensure that no significant impact of the Project would result from landslides. The impact would be ***less than significant***.

b) Result in substantial soil erosion or the loss of topsoil?

Construction

Project construction activities would involve stockpiling, grading, excavation, paving, and other earth-disturbing activities which would result in loose and disturbed soils. Loose and disturbed soils are more prone to erosion and loss of topsoil by wind and water. Therefore, if no measures are taken, the Project could result in soil erosion and the loss of topsoil. However, as a project that would disturb over one acre of land, the Project would be subject to NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2022-0057-DWQ), as adopted by the SWRCB. To comply with permit requirements, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared, which would outline site characteristics, facility details, erosion and sediment control measures, runoff water quality monitoring, waste disposal methods, adherence to approved local plans, construction site management practices, maintenance responsibilities, and controls for non-stormwater discharges. As detailed in *Section 4.10, Hydrology and Water Quality*, the Project must also comply with the applicable Municipal Separate Storm Sewer System (MS4) Permit under the NPDES, as well as Sonoma County Code Chapters 11 and 11A. These regulations require implementation of BMPs to minimize stormwater pollution, control runoff from construction sites, and manage stormwater volume and flow rates. Compliance with permit requirements would ensure that Project construction would not result in substantial soil erosion or loss of topsoil. The impact would be ***less than significant***.

Operation and Maintenance

All disturbed areas of the Project site would be replanted with native vegetation after construction work is complete. Some erosion control materials, such as those made of natural materials (e.g., straw wattles), may be left in place after construction is complete to help restabilize soils and reduce erosion. Revegetation of disturbed areas and proper erosion control measures would ensure that Project operation would not result in substantial soil erosion or loss of topsoil. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

c, d) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse? Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code, creating substantial direct or indirect risks to life or property?

As discussed above in Threshold a), soils in the Project site are at a moderate to high risk of liquefaction and lateral spreading. The Project has been designed in accordance with Caltrans Seismic Design Criteria and the recommendations of the Preliminary Foundations Report. These recommendations account for the suitability of on-site geological conditions for construction of the Project; therefore, compliance with the recommendations would ensure that no significant impact of the Project would result from unstable geologic or soil units, or expansive soils. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The Project would not involve the use of septic tanks or alternative wastewater disposal systems. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The Project site is underlain by Holocene (Qha) and late Pleistocene (Qpa) alluvium (Sonoma County Agriculture and Open Space District 2015). Borings taken during the preliminary foundation study found that the site is underlain by alluvium consisting of sand, silt, gravel and clay, and Sonoma Volcanic tuff. Alluvium is the term for unconsolidated sediments that are typically deposited by flowing water. Younger Quaternary alluvial deposits (less than 10,000 years old) are generally known to have low paleontological potential because they are typically too young to contain in-situ fossils. Older Quaternary alluvial deposits, however, have an undetermined potential for paleontological resources, which may be high or low depending on their paleontological content, geologic age, and depositional environment. Based on the Sonoma County General Plan EIR, paleontological remains within the County have been primarily recovered from Franciscan complex (Jurassic), Wilson Grove (Miocene-Pliocene), and Sonoma Volcanics (Miocene-Pliocene) formation (County of Sonoma 2006).

As described above, Sonoma Volcanics tuff was identified in the on-site borings and is one of the three primary geologic formations in Sonoma County known to contain paleontological resources. Older Quaternary alluvium on-site may also contain palaeontological resources. Although there are no known paleontological resources or unique geologic features present within the Project site, such resources may be encountered during ground-disturbing activities associated with construction (e.g., grading, excavation). Ground-disturbing activities have the potential to result in the destruction, damage, or loss of undiscovered scientifically significant paleontological resources, which is a potentially significant impact. Therefore, Mitigation Measures GEO-1 through GEO-6 would be implemented, which require paleontological review of Project plans and monitoring, if needed, by a Qualified Professional Paleontologist or designated paleontological monitor. These measures also require a Paleontological WEAP training for construction workers, which will be given by the Qualified Paleontologist. With implementation of these measures, the Project would not directly or indirectly destroy a unique paleontologist resource or geologic feature. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure GEO-1: Paleontological Review of Project Plans

The Project applicant shall retain a Qualified Professional Paleontologist to review proposed ground disturbance associated with development to:

1. Assess if the Project will require paleontological monitoring;
2. If monitoring is required, to develop a Project-specific Paleontological Resource Mitigation and Monitoring Program (PRMMP) as outlined in Mitigation Measure GEO-2;
3. Draft the Paleontological Worker Environmental Awareness Program as outlined in Mitigation Measure GEO-3; and
4. Define within a Project-specific PRMMP under what specific ground disturbing activity paleontological monitoring will be required and what procedures for collection and curation of recovered fossils, as described in Mitigation Measure GEO-4, GEO-5, and GEO-6.

The assessment of monitoring requirements will be established by the Qualified Paleontologist and will be based on the location and depth of ground disturbing activity in the context of paleontological potential and potential impacts. A Qualified Professional Paleontologist is defined by the SVP standards as an individual preferably with an M.S. or Ph.D. in paleontology or geology who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as a paleontological mitigation project supervisor for a least two years (SVP 2010). The County shall review and approve the assessment before grading permits are issued.

Mitigation Measure GEO-2: Paleontological Resources Mitigation and Monitoring Program

If the Project is determined to require a PRMMP, the Qualified Paleontologist shall prepare a PRMMP for submission to the County prior to the issuance of grading permits. The PRMMP shall include a pre-construction paleontological site assessment and develop procedures and protocol for paleontological monitoring and recordation. Monitoring shall be conducted by a qualified paleontological monitor who meets the minimum qualifications per standards set forth by the SVP.

The PRMMP procedures and protocols for paleontological monitoring and recordation shall include:

1. Location and type of ground disturbance requiring paleontological monitoring.
2. Timing and duration of paleontological monitoring.
3. Procedures for work stoppage and fossil collection.
4. The type and extent of data that should be collected with recovered fossils.
5. Identify an appropriate curatorial institution.
6. Identify the minimum qualifications for qualified paleontologists and paleontological monitors.
7. Identify the conditions under which modifications to the monitoring schedule can be
8. implemented.
9. Details to be included in the final monitoring report.

Prior to starting construction, copies of the PRMMP shall be submitted to the County for review and approval as to adequacy.

Mitigation Measure GEO-3: Paleontological Worker Environmental Awareness Program (WEAP)

Prior to any ground disturbance within the Project site, the applicant shall incorporate information on paleontological resources into the project's WEAP materials, or a stand-alone Paleontological Resources WEAP shall be submitted to the County for review and approval. The WEAP shall be given by a qualified paleontologist and shall include information on the appearance of fossils and procedures for notifying staff should fossils be discovered. The Paleontological WEAP training shall be fulfilled simultaneously with the overall WEAP training, or

at the first preconstruction meeting. Printed literature shall accompany the initial training. Following the initial WEAP training, all new workers and contractors must be trained prior to ground disturbing work. A sign-in sheet for workers who have completed the training shall be submitted to the County upon completion of WEAP administration.

Mitigation Measure GEO-4: Paleontological Monitoring

Paleontological monitoring shall only be required for those ground-disturbing activities identified under Mitigation Measure GEO-1, where construction activities (i.e., grading, trenching, foundation work) are proposed in previously undisturbed (i.e., intact) sediments with high paleontological sensitivities. Monitoring shall be conducted by a qualified professional paleontologist or by a qualified paleontological monitor (as defined below) under the supervision of the qualified professional paleontologist. Monitoring may be discontinued on the recommendation of the qualified professional paleontologist if they determine that sediments are likely too young, or conditions are such that fossil preservation would have been unlikely, or that fossils present have little potential scientific value.

The following outlines minimum monitor qualifications and procedures for fossil discovery and treatment:

1. Monitoring. Paleontological monitoring shall be conducted by a qualified paleontological monitor, who is defined as an individual who has experience with collection and salvage of paleontological resources and meets the minimum standards of the SVP (2010) for a Paleontological Resources Monitor. The Qualified Paleontologist will determine the duration and timing of the monitoring based on the location and extent of proposed ground disturbance. If the Qualified Paleontologist determines that full-time monitoring is no longer warranted, based on the specific geologic conditions at the surface or at depth, they may recommend that monitoring be reduced to periodic spot-checking or cease entirely.
2. Fossil Discoveries. In the event of a fossil discovery by the paleontological monitor or construction personnel, all work in the immediate vicinity of the find shall cease. A Qualified Paleontologist shall evaluate the find before restarting construction activity in the area. If the Qualified Paleontologist determines that the fossil(s) is (are) scientifically significant; including identifiable specimens of vertebrate fossils, uncommon invertebrate, plant, and trace fossils; the Qualified Paleontologist (or paleontological monitor) shall recover them following standard field procedures for collecting paleontological as outlined in the PRMMP prepared for the project.
3. Salvage of Fossils. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case the Qualified Paleontologist shall have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner. If fossils are discovered, the Qualified Paleontologist (or paleontological monitor) shall recover them as specified in the project's PRMMP.

Mitigation Measure GEO-5: Preparation and Curation of Recovered Fossils

Once salvaged, significant fossils shall be identified to the lowest possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent

paleontological collection (such as the University of California Museum of Paleontology), along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Qualified Paleontologist.

Mitigation Measure GEO-6: Final Paleontological Mitigation Report

Upon completion of ground disturbing activity (and curation of fossils if necessary) the Qualified Paleontologist shall prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where fossils were curated. The report shall be submitted to the County prior to occupancy permits. If the monitoring efforts produced fossils, then a copy of the report shall also be submitted to the designated museum repository.

4.8 Greenhouse Gas Emissions

This section describes the existing setting of the Project site as it relates to greenhouse gas (GHG) emissions, identifies associated regulatory requirements, analyzes potential impacts related to the generation of GHG emissions, and identifies mitigation measures as needed to reduce the impacts of the proposed Project with respect to GHG emissions.

4.8.1 Setting

CLIMATE CHANGE AND GREENHOUSE GASES

Climate change refers to the long-term alteration of Earth's climate, characterized by a rise in average atmospheric and oceanic temperatures, as well as notable shifts in weather patterns, precipitation, and storm activity. Although often used interchangeably with global warming, the term "climate change" is preferred because it encompasses a broader range of environmental changes beyond just temperature increases.

These changes are assessed against historical climate data, including records from past ice ages. Earth's climate has naturally fluctuated over geological time, with gradual warming and cooling trends occurring over thousands of years. Over the last 10,000 years, the planet has experienced a steady warming trend, evidenced by the consistent retreat of glaciers. However, in the past 150 years, scientists have identified a rapid acceleration in warming. According to the Intergovernmental Panel on Climate Change (IPCC), there is a high degree of confidence that human activities have been the primary driver of global warming since the mid-20th century (IPCC 2014).

The term greenhouse gas (GHG) is used to describe atmospheric gases that trap heat in the Earth's atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor, among others. A growing body of research attributes long-term changes in temperature, precipitation, and other elements of Earth's climate to large increases in GHG emissions since the mid-nineteenth century, particularly from human activity related to fossil fuel combustion. Anthropogenic GHG emissions of particular interest include CO_2, CH_4, N_2O, and fluorinated gases.

GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO_2 is the most prominent GHG, so amounts of other gases are expressed relative to CO_2, using a metric called "carbon dioxide equivalent" (CO_2e). The global warming potential of CO_2 is assigned a value of 1, and the warming potential of other gases is assessed as multiples of CO_2. For example, the 2007 IPCC Fourth Assessment Report calculates the GWP of CH_4 as 25 and the GWP of N_2O as 298, over a 100-year time horizon. Generally, estimates of all GHGs are summed to obtain total emissions for a project or given period, usually expressed in metric tons ($MTCO_2e$), or million metric tons ($MMTCO_2e$).

SOURCES OF GREENHOUSE GAS EMISSIONS

As evidence has mounted for the relationship of climate changes to rising GHGs, federal and state governments have established numerous policies and goals targeted to improving energy efficiency and fuel economy and reducing GHG emissions. Nationally, electricity generation is the largest source of GHG emissions, followed by transportation. In California, however, the transportation sector is the largest contributor to GHGs.

GREENHOUSE GAS EMISSIONS INVENTORY

National

The EPA reported that in 2022, total gross nationwide GHG emissions were 6,343 $MMTCO_2e$ These emissions were lower than peak levels of 7,416 $MMTCO_2e$ that were emitted in 2007 (U.S. EPA 2025).

Statewide

CO2 accounted for 84 percent of California's total GHG emissions in 2015. Transportation, primarily on-road travel, is the single largest source of CO2 emissions in the state. CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2012 emissions (CARB 2025). In 2012, GHG emissions from statewide emitting activities were 371.1 MMT. Per capita GHG emissions in California have dropped from a 2001 peak of 14.0 MMT per person to 9.3 MMT per person in 2022, a 33 percent decrease. They are also 9.3 MMT lower than 2021 emissions. The most recent Bay Area emission inventory was computed for the year 2011 (Bay Area Air District 2015). The Bay Area GHG emissions were 87 MMT. As a point of comparison, statewide emissions were about 444 MMT in 2011.

Regional and Local

Sonoma County emissions in 2018 were 3.41 MMTCO2e, slightly below 2015 emissions of 3.44 $MMTCO_2e$. Relative to 1990 emissions, 2018 emissions decreased by 13 percent. However, to meet the 2030 target of 40 percent below 1990 emissions (2.37 $MMTCO_2e$), Sonoma County must reduce emissions at a faster rate than it achieved between 1990 and 2018. Approximately 60 percent of total countywide emissions were from transportation in 2018. Between 2015 and 2018, vehicle miles traveled by residents and employees within the County increased by almost 10 percent or approximately one million miles per day. Emissions during this same time period increased by three percent. Emissions have risen at a lower rate than VMT due to improvements in fuel efficiency and a shift from fossil fuel vehicles to hybrid and electric vehicles (RCPA 2020).

4.8.2 Regulatory Setting

FEDERAL REGULATIONS

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. However, the U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) issued the first corporate fuel economy (CAFE) standards in 2010, requiring cars and light-duty vehicles to achieve certain fuel economy targets by 2016, with the intention of gradually increasing the targets and the range of vehicles to which they would apply.

STATE REGULATIONS

California's Advanced Clean Cars Program (Assembly Bill 1493)

Assembly Bill (AB) 1493, passed in 2002, established California's Advanced Clean Cars program (commonly known as "Pavley"), which directs the CARB to develop and implement regulations that achieve the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles. On June 30, 2009, the U.S. EPA granted California a waiver from Clean Air Act

preemption, allowing the state to enforce its GHG emission standards beginning with the 2009 model year.

Pavley I applies to vehicle model years 2009 through 2016, while Pavley II—now referred to as the Low Emission Vehicle III GHG standard—covers model years 2017 through 2025. The broader Advanced Clean Cars program integrates the objectives of the Low Emission Vehicle, Zero Emission Vehicle, and Clean Fuels Outlet programs, collectively aiming to significantly reduce GHG emissions. Once fully implemented in 2025, the program is expected to cut GHG emissions from new vehicles by 34 percent and reduce smog-forming emissions by 75 percent compared to 2016 levels (CARB 2011).

California Global Warming Solutions Act of 2006

California's primary strategy for reducing greenhouse gas emissions is established under AB 32, the "California Global Warming Solutions Act of 2006," which was enacted to set the goal of returning statewide greenhouse gas emissions to 1990 levels by the year 2020. AB 32 directs the CARB to develop a Scoping Plan that outlines the state's key strategies for achieving this target. It also requires the adoption of regulations for the reporting and verification of GHG emissions across the state.

Following this directive, the CARB determined that the 1990 emissions level and the target for 2020 would be 427 million metric tons of carbon dioxide equivalent. The initial Scoping Plan, approved on December 11, 2008, included a variety of strategies focused on reducing emissions through improved energy efficiency, water conservation, recycling, and solid waste management, among other areas. Since its adoption, many of the plan's core measures such as the Low Carbon Fuel Standard, the Advanced Clean Cars program, and the Cap and Trade system have been implemented.

Senate Bill 32

Senate Bill (SB) 32, signed into law on September 8, 2016, builds on AB 32 by requiring the State to reduce GHG emissions to 40 percent below 1990 levels by the year 2030, while all other provisions of AB 32 remain unchanged. On December 15, 2022, the CARB adopted the 2022 Scoping Plan, which outlines the strategy for meeting the 2030 emissions target and to achieve carbon neutrality by 2045.

The 2022 Scoping Plan emphasizes key components of the state's strategy to achieve carbon neutrality, including the transition to renewable energy sources, electrification of transportation and buildings and carbon management and hydrogen production. The plan anticipates significant economic benefits, including the creation of four million new jobs and a reduction of $200 billion in health costs due to pollution by 2045. Similar to the 2017 Scoping Plan Update, the 2022 plan does not establish project level thresholds for land use development. Instead, it encourages local governments to adopt policies and quantitative thresholds that align with the State's per capita emissions goals of 6 metric tons of carbon dioxide equivalent by 2030 and 2 metric tons by 2050. According to the 2022 Scoping Plan, these goals are intended for broader plan level assessments at the city, county, subregional, or regional scale and are not designed for use in evaluating individual projects, as they encompass all emissions sectors within the State.

Senate Bill 100

SB 100, adopted on September 10, 2018, advances efforts to reduce GHG emissions from the electricity sector by accelerating the goals of California's Renewables Portfolio Standard Program, which was previously updated by SB 350 in 2015. Under SB 100, electricity providers are required to obtain 33 percent of their retail electricity from eligible renewable sources by 2020, 60 percent by 2030, and transition to 100 percent renewable or zero carbon energy by 2045.

Senate Bill 97

SB 97, signed into law in August 2007, amended the Public Resources Code by adding Section 21083.05 and repealing Section 21097. This legislation formally recognizes climate change as an environmental issue that must be addressed in documents prepared under CEQA. In March 2010, the California Natural Resources Agency adopted revisions to the CEQA Guidelines to support the feasible mitigation of greenhouse gas emissions and their environmental effects. These updated guidelines allow lead agencies to establish their own quantitative or qualitative thresholds for evaluating and addressing the impacts of GHG emissions and climate change.

Senate Bill 375

SB 375, signed in August 2008, strengthens California's efforts to meet the goals of AB 32 by requiring the CARB to establish regional greenhouse gas emission reduction targets for passenger vehicles for the years 2020 and 2035. The bill directs each of the state's 18 major Metropolitan Planning Organizations to develop a Sustainable Communities Strategy, which outlines a land use and transportation plan to meet the assigned emission targets and is incorporated into the Regional Transportation Plan. On March 22, 2018, the CARB adopted updated targets for reducing greenhouse gas emissions from 2005 levels by 2020 and 2035. In the Association of Bay Area Governments region, the targets include a 10 percent reduction by 2020 and a 19 percent reduction by 2035 from transportation-related sources. SB 375 also allows subregional councils of governments and county transportation commissions in the region to collaboratively develop subregional plans to fulfill the bill's requirements.

Senate Bill 1383

SB 1383 was adopted in September 2016 and requires the CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the strategy to achieve the following reduction targets by 2030:

1. Methane – 40 percent below 2013 levels
2. Hydrofluorocarbons – 40 percent below 2013 levels
3. Anthropogenic black carbon – 50 percent below 2013 levels

This bill also requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with the CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

Executive Order B-55-18

On September 10, 2018, Governor Jerry Brown issued Executive Order B 55 18, setting a new statewide goal of achieving carbon neutrality by the year 2045, with the intention of reaching

and sustaining net negative emissions beyond that point. This objective complements the existing GHG reduction targets established under Senate Bills 375, 32, 1383, and 100.

California Integrated Waste Management Act (AB 341)

The California Integrated Waste Management Act of 1989, amended by AB 341, mandates that each jurisdiction's source reduction and recycling plan include a timeline for meeting specific waste diversion goals. These goals include diverting 25 percent of all solid waste by January 1, 1995, through activities like source reduction, recycling, and composting; diverting 50 percent of solid waste starting January 1, 2000; and diverting 75 percent of solid waste by 2020, with this target to be maintained annually thereafter. CalRecycle is responsible for developing strategies to implement AB 341, including those related to source reduction.

REGIONAL AND LOCAL REGULATIONS

Bay Area Air Quality Management District

The Bay Area Air District does not have an adopted threshold of significance for construction-related GHG emissions. The Bay Area Air District recommends that lead agencies disclose construction generated emissions to make determinations of significance of GHG emissions and incorporate best management practices to reduce emissions as possible.

Regional Climate Protection Authority

The Regional Climate Protection Authority (RCPA) was formed in 2009 to coordinate climate protection efforts among Sonoma County's nine cities and multiple agencies, including those of unincorporated Sonoma County. RCPA has developed a Climate Mobilization Strategy, identified climate hazards and vulnerabilities, and developed an action plan for local governments to facilitate a significant shift in transportation behavior in Sonoma County, a reduction in VMT, and an increase in electric vehicle use.

In 2016, the RCPA developed a regional climate action plan (Climate Action 2020 and Beyond). The Plan contains concrete actions to reduce GHG emissions countywide including:

- Reduce travel demand through focused growth
- Encourage a shift toward low-carbon transportation options
- Increase vehicle and equipment fuel efficiency
- Encourage a shift toward low-carbon fuels in vehicles and equipment
- Reduce idling

Through the implementation of more than 60 state, regional, and local reduction measures, Sonoma County plans to achieve the State mandated GHG emissions reduction targets; 40 percent by 2030 and by 80 percent by 2050 (RCPA 2016).

Sonoma County General Plan

The Sonoma County General Plan Open Space and Resource Conservation Element contains the following relevant policies related to GHG emissions:

> **Policy OSRC-14c:** Continue to purchase and utilize hybrid, electric, or other alternative fuel vehicles for the County vehicle fleet; and encourage County residents and businesses to do the same.

Policy OSRC-14d: Support project applicants in incorporating cost effective energy efficiency that may exceed State standards.

Policy OSRC-14e: Develop energy conservation and efficiency design standards for new development.

Policy OSRC-14f: Use the latest green building certification standards, such as the Leadership in Energy and Environmental Design (LEED) standards, for new development.

Policy OSRC-14i: Manage timberlands for their value both in timber production and offsetting greenhouse gas emissions.

Plan Bay Area

AB 375 requires the Bay Area regional planning agencies to include Sustainable Communities Strategies (SCSs) in their regional transportation plan updates to describe how the GHG emissions reductions set by CARB would be met through land-use and transportation planning. In 2010, the Metropolitan Transportation Commission (MTC) approved a set of "Bay Area Principles for Establishing Regional Greenhouse Gas Reduction Targets" (Resolution 3970) that proposed per-capita GHG emissions reductions of seven percent from 1990 by 2020 and 15 percent by 2035. Subsequently, MTC, along with ABAG, developed SCS plans to meet state targets for reducing GHG emissions from light-duty vehicles. Plan Bay Area 2050 is the recently adopted RTP. It includes new and/or updated transportation projects and Climate Initiatives (Plan Bay Area 2021). Plan Bay Area 2050 was adopted by both MTC and ABAG on October 21, 2021, and approved by the FHWA and Federal Transit Administration (FTA) on December 3, 2021.

The proposed Project, located in unincorporated Sonoma County, is included in the current RTP/SCS, Plan Bay Area 2050. Plan Bay Area 2050 uses the base year of 2015 for the existing conditions, except for GHG emissions, where a 2005 baseline is once again used for the analysis of SB 375 greenhouse gas reduction targets. The plan also uses a 1990 baseline for analyzing consistency with SB 32, which calls for a statewide reduction of GHG emissions to 40 percent from 1990 levels by 2030.13 Plan Bay Area 2050 has established 2050 as the current RTP horizon year.

4.8.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or,*

b) *Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.*

METHODOLOGY

CalEEMod was used to estimate GHG emissions from construction of the new bridge, demolition of the old one, and constructing the redesigned roadway connections as previously described in *Section 4.3, Air Quality*. CalEEMod outputs are included in Appendix B.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

GHG emissions associated with the proposed Project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term operational emissions associated with vehicular traffic on the new bridge and redesigned roadway connections.

Construction

GHG emissions associated with construction were estimated to be 1,145 MT of CO_2e for the 12-month construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the County nor NoSoCo Air District have an adopted threshold of significance for construction related GHG emissions, however, emissions are often quantified and disclosed for CEQA. The Project is considered a "non-capacity increasing" project under Caltrans' Interim CEQA Guidance for Greenhouse Gas Emissions Impacts (2019). Although the new bridge would contain two traffic lanes as opposed to the single lane on the existing bridge, no additional roadway capacity would be added to Chalk Hill Road as a result of replacing the existing bridge. Roadway segments on either side of the bridge would remain as they currently exist and no increase in traffic is expected to occur. According to Caltrans, non-capacity increasing projects are normally considered to have less-than-significant construction GHG emissions if standard best management practices (BMPs) are incorporated into Project construction activities. These practices include the following:

- Alternative fuels such as renewable diesel should be used for construction equipment.
- Limit idling to 5 minutes for delivery and dump trucks and other diesel-powered equipment.
- Schedule truck trips outside of peak morning and evening commute hours.
- Incorporate measures to reduce consumption of potable water.
- Encourage Improved fuel efficiency from construction equipment (e.g., maintain equipment in proper tune and working condition, right size equipment for the job, use equipment with new technologies).
- Construction Environmental Training: Supplement existing training with information regarding methods to reduce GHG emissions related to construction.
- Salvage large, removed trees for lumber or similar on-site beneficial uses other than standard woodchipping (e.g., use in roadside landscape projects or green infrastructure components).
- Lower the rolling resistance of highway surfaces as much as possible while still maintaining design and safety standards.

The Project's construction specifications will incorporate relevant the above list of BMPs to the extent feasible and appropriate for the new bridge design and site. Therefore, construction of the project would not generate GHG emissions that may have a significant impact on the environment. The impact would be ***less than significant***.

Operation

GHG emissions from the Project would be generated primarily from traffic using the new bridge and roadway connections. The Project would not increase the VMT in the County, nor would it

alter traffic speeds or volumes. Therefore, GHG emissions from operation of the Project are expected to be less than existing conditions due to newer, less polluting vehicles replacing older vehicles operating in the County over time. Operation of the Project would not generate GHG emissions that may have a significant impact on the environment. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed Project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan. Vehicles using the new bridge would be subject to CARB emissions standards which are projected to reduce the amount of GHGs emitted in future. The Project is included in Plan Bay Area 2050 and its SCS goals and supports the goals of the region's climate action plan. Therefore, the Project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

4.9 Hazards and Hazardous Materials

This section describes the existing setting of the Project site related to hazards and hazardous materials, identifies associated regulatory requirements, analyzes potential impacts related to hazards and hazardous materials, and identifies mitigation measures as needed to reduce Project impacts relating to hazards and hazardous materials.

4.9.1 Setting

According to the California Health and Safety Code, hazardous materials include substances that, due to their quantity, concentration, or physical or chemical properties, may pose a significant risk to human health, safety, or the environment if released. In Sonoma County, such materials are commonly found in agricultural, industrial, commercial, medical, research, and residential settings. Their handling, including production, transport, storage, and disposal, is regulated by a range of federal and state laws, as well as local plans and policies.

Historical and current land use patterns are strong indicators of both the likelihood of past hazardous material contamination and the ongoing use and storage of such materials. Industrial facilities and certain commercial operations (e.g., gas stations) tend to involve larger quantities of hazardous substances compared to residential areas. These land use patterns also help identify the proximity of sensitive receptors, including schools, childcare centers, hospitals, and nursing homes. In many areas, industrial and commercial activities are concentrated along key transportation routes, such as U.S. Highway 101, and within downtown districts.

There are no existing or proposed schools within 0.25 miles of the Project site.

EXISTING HAZARDOUS MATERIALS CONTAMINATION

Based on a review of the State Water Resources Control Board's (SWRCB's) GeoTracker database and the Department of Toxic Substances Control's (DTSC's) EnviroStor database, there are no listed hazardous material contamination sites within 0.5 mile of the Project site (DTSC 2025, SWRCB 2025). The only structure within the Project site is the existing bridge, which is made primarily out of concrete. Therefore, the bridge does not have the potential to contain hazardous materials such as asbestos-containing material or lead-based paint, which are typically found in building materials such as insulation, ceiling and floor materials, siding and roofing, paints, and adhesives. There is no potential for hazardous materials or waste to be present within the Project site; therefore, no Phase I Environmental Site Assessment was conducted for the Project.

AIRPORTS AND AIRCRAFT HAZARDS

The Project site is not within an airport influence area, defined as an area in which current or future airport-related noise, over flight, safety, or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses. There are no airports or private air strips within two miles of the Project site.

WILDFIRE

Wildland fire hazards are discussed in *Section 4.20, Wildfire*.

4.9.2 Regulatory Setting

FEDERAL REGULATIONS

U.S. Environmental Protection Agency

The U.S. EPA is the primary agency responsible for the enforcement and implementation of federal laws and regulations pertaining to hazardous materials. Applicable federal regulations pertaining to hazardous materials are contained in the CFR Titles 29, 40, and 49. Hazardous materials, as defined in the CFR, are listed in 49 CFR 172.101. The management of hazardous materials is governed by the following laws:

1. RCRA of 1976 (42 USC 6901 et seq.); Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also called the Superfund Act) (42 USC 9601 et seq.)
2. Federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 et. Seq.)
3. Superfund Amendments and Reauthorization Act of 1986 (Public Law 99 499)

These laws and associated regulations include specific requirements for facilities that generate, use, store, treat, and/or dispose of hazardous materials. The EPA provides oversight and supervision for Federal Superfund investigation/remediation projects, evaluates remediation technologies, and develops hazardous materials disposal restrictions and treatment standards.

Toxic Substances Control Act and the Resource Conservation and Recovery Act

The Toxic Substances Control Act (TSCA) and the Resource Conservation and Recovery Act (RCRA), both administered by the U.S. EPA, govern the generation, transportation, treatment, storage, and disposal of hazardous waste. Enacted in 1976, the RCRA was later amended by the Hazardous and Solid Waste Amendments of 1984, which reinforced and expanded the 'cradle-to-grave' framework for hazardous waste management. These amendments also prohibited specific disposal methods for certain types of hazardous waste.

STATE REGULATIONS

Department of Toxic Substances Control

The Department of Toxic Substances Control (DTSC) is a department of the California EPA and is the primary agency in California that regulates hazardous waste, cleans up existing contamination, and develops procedures to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of the RCRA and the California Health and Safety Code.

DTSC also governs the California Hazardous Waste Control Law (HWCL) to regulate hazardous wastes. While the HWCL is generally more stringent than the RCRA, until the U.S. EPA approves the California program, both state and federal laws apply in California. The HWCL lists 791 chemicals and approximately 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

Government Code Section 65962.5 requires the DTSC, the California Department of Health Services, the State Water Resources Control Board, and CalRecycle to compile and annually

update lists of hazardous waste sites and land designated as hazardous waste sites throughout the state. The Secretary for Environmental Protection consolidates the information submitted by these agencies and distributes it to each city and county where sites on the lists are located. Before the lead agency accepts an application for any development project as complete, the applicant must consult these lists to determine if the site at issue is included.

If any soil is excavated from a site containing hazardous materials, it would be considered a hazardous waste if it exceeded specific criteria in Title 22 of the California Code of Regulations. Remediation of hazardous wastes found at a site may be required if excavation of these materials is performed, or if certain other soil disturbing activities would occur. Even if soil or groundwater at a contaminated site does not have the characteristics required to be defined as hazardous waste, remediation of the site may be required by regulatory agencies subject to jurisdictional authority. Cleanup requirements are determined on a case-by-case basis by the agency taking jurisdiction.

Hazardous Waste Control Act

The hazardous waste management program was created by the Hazardous Waste Control Act (California Health and Safety Code Section 25100 et seq.), which is implemented by regulations described in CCR Title 26. The State program is similar to, but more stringent than, the Federal program under the RCRA. The regulations list materials that may be hazardous, and establish criteria for their identification, packaging, and disposal. Environmental health standards for management of hazardous waste are contained in CCR Title 22, Division 4.5. As required by California Government Code Section 65962.5, DTSC maintains a Hazardous Waste and Substances Site List for the State called the Cortese List.

California Fire and Building Code

The 2016 Fire and Building Code outlines minimum requirements aligned with nationally recognized standards to protect public health, safety, and welfare from fire, explosion, and other hazardous conditions in both new and existing buildings, structures, and premises. It also aims to ensure the safety of firefighters and emergency responders during emergency operations. The code applies statewide in California and governs the construction, alteration, relocation, enlargement, replacement, repair, use, occupancy, maintenance, and demolition of all buildings and structures, including associated appurtenances.

REGIONAL AND LOCAL REGULATIONS

Sonoma County Multi-Jurisdictional Hazard Mitigation Plan

The County of Sonoma's Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) 2021 Update outlines a long-term strategy for reducing the impacts of natural and human-caused hazards throughout the County. The plan identifies potential threats such as wildfires, floods, earthquakes, and hazardous materials incidents, and proposes actions to minimize risks to life, property, and critical infrastructure. It serves as a guide for decision making and resource allocation, and supports coordinated mitigation efforts across all jurisdictions, including cities, special districts, and unincorporated areas. The plan also ensures the County remains eligible for federal funding to implement mitigation projects and strengthen overall resilience (County of Sonoma 2021).

Sonoma County Environmental Health and Safety Department

The Sonoma County Environmental Health and Safety Department is responsible for protecting public health, preventing disease, and promoting well-being throughout the county. The department implements various programs aimed at mitigating health hazards, including a Leaking Underground Storage Tank (LUST) oversight program that manages the investigation and remediation of fuel releases from underground storage tanks in most areas of the County. Additional programs address healthy housing, septic system inspections, and solid waste management.

Sonoma County General Plan

The Sonoma County General Plan Public Safety Element contains the following relevant policies related to hazards and hazardous materials:

> **Policy PS-4a:** While maintaining the autonomy granted to it pursuant to State zoning laws, implement Federal, State, and County requirements for the storage, handling, disposal, and use of hazardous materials, including requirements for management plans, security precautions, and contingency plans.
>
> **Policy PS-4b:** Prepare and maintain an inventory of sites with storage or use of hazardous materials in threshold planning quantities as determined by Federal and State laws.
>
> **Policy PS-4c:** Require a use permit for any commercial or industrial use involving hazardous materials in threshold planning quantities as determined by Federal and State laws. Hazardous materials management plans shall be required as a condition of approval for such permits.
>
> **Policy PS-4d:** Work with applicable regulatory agencies to regulate the transportation of hazardous materials consistent with adopted County policies.

4.9.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;*

b) *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;*

c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;*

d) *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;*

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;*

f) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or,*

g) *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.*

PROJECT IMPACTS AND MITIGATION MEASURES

a-b) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Construction

Construction of the Project would include the use of construction equipment and machinery that would necessitate the transport, use, and disposal of hazardous materials such as oils, grease, lubricants, and solvents. These types of materials are not acutely hazardous and are used routinely for all types of construction projects. The storage, handling, use, transport, and disposal of these materials is regulated by federal, state, and local regulations as described in *Regulatory Setting*. The Project would be required to comply with all applicable regulations related to the storage, handling, transport, use, and disposal of hazardous materials. In addition, implementation of standard BMPs under the required Stormwater Pollution Prevention Plan (SWPPP) for the Project (see *Section 4.10, Hydrology and Water Quality*) would further reduce the potential of accidental release of hazardous materials. The existing bridge is not known to contain any hazardous materials such as asbestos-containing materials or lead-based paint. Operation of the Project would not require the use of hazardous materials. Therefore, construction or operation of the Project would not create a significant hazard to the public or environment through the routine transport, use or disposal of hazardous materials, or through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

As described above, there are no existing or proposed schools within 0.25 miles of the Project site. Therefore, the Project would not emit hazardous emissions or handle hazardous materials,

substances, or waste within one quarter mile of an existing or proposed school. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

As described above, the Project site is not located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. There are no listed sites within 0.5 miles of the Project site. Therefore, ***no impact*** would occur.

Mitigation Measures

No mitigation measures are required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

As described above, the Project is not located within an airport land use plan or within two miles of a public airport or public use airport. ***No impact*** related to airport hazards would occur.

Mitigation Measures

No mitigation measures are required.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The existing bridge would remain in use throughout the first season of construction while the new bridge is being constructed. At the end of the first construction season, traffic would be switched onto the new bridge. This schedule of work ensures that access through the Project site would be maintained at all times. During construction, emergency vehicles may need to stop temporarily or slow to ensure they can safely pass through the project site. However, as discussed in *Section 4.17, Transportation*, Mitigation Measure TRAN-1 would be implemented, which requires the construction contractor to notify emergency service providers (i.e. fire departments, police departments, ambulance, and paramedic services) of the construction schedule and potential for delays. Implementation of this measure would ensure that all emergency response services are aware of the potential delays through the Project site so they can plan accordingly. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure TRAN-1 (see *Section 4.17, Transportation*) would be implemented, which would reduce impacts to a less-than-significant level.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Refer to *Section 4.20, Wildfire*, for an analysis of impacts related to wildfire.

The Project is located in an area of moderate to very high wildfire hazard. However, the Project would not expose people or structures to increased risk from wildfires beyond existing conditions in the Project area. No new buildings would be constructed that would be occupied by people or structures that would be affected by wildland fires. The Project consists of replacing an existing bridge, which would not increase the vehicle capacity of the new bridge or encourage growth within the region. The bridge would be designed in conformance with AASHTO standards to accommodate emergency vehicles. Therefore, the Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

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4.10 Hydrology and Water Quality

This section describes the existing setting of the Project site as it relates to hydrology and water quality, identifies associated regulatory requirements, evaluates potential Project-level impacts, and identifies mitigation measures needed to reduce project impacts on hydrology and water quality.

4.10.1 Setting

Water quality can affect human health, business operations, aquatic life, and overall ecosystem health. Water quality can be influenced by the natural state of surface and groundwater, as well as by both natural and human-caused sources of pollution.

The Project's receiving waterbody is Maacama Creek, which is a tributary to the Russian River. At the project site, Chalk Hill Road bridge crosses over Maacama Creek, which flows southward before turning west and draining into the Russian River. The Project site is within the Russian Watershed, which encompasses areas of Sonoma and Mendocino counties, and the Middle Russian River Subwatershed (Figure 4.10-1).

Per the CalWater watershed delineation in Caltrans' Water Quality Planning Tool (2012), the Project site is within an undefined Hydrologic Sub-Area Guerneville (#114.25) of the Middle Russian River Hydrologic Area in the Russian River Hydrologic Unit. The watershed drainage areas at the Project site were delineated using the USGS StreamStats application. At the existing bridge, the watershed drains an area of approximately 46 square miles (USGS 2025a). The proposed new bridge would be at an alignment downstream of the existing bridge. Receiving water bodies within the Project vicinity are shown in Figure 4.10-2.

WATER QUALITY

Surface Water

The Project site's receiving waterbody is Maacama Creek, which flows generally from east to west in the site area. Maacama Creek drains to the Russian River approximately 0.85 miles southwest of the Project site. The Russian River eventually empties into the Pacific Ocean approximately 23 miles southwest of the Project site.

The proposed Project falls under the jurisdiction of the North Coast Regional Water Quality Control Board (NCRWQCB). This regional board is responsible for establishing waste discharge requirements for various sources, including industrial and commercial operations, municipal wastewater systems, and individual septic tanks (County of Sonoma 2008). One of the main threats to water quality in the area comes from contaminated runoff, which can transport a wide range of pollutants such as pesticides, fertilizers, yard debris, animal and human waste, petroleum products like gasoline and oil, trash, and other substances of concern. When rainwater flows over roads and transportation infrastructure, it collects these pollutants and conveys them through both natural waterways and engineered storm drains, eventually reaching local surface waters.

To safeguard these water resources, the NCRWQCB sets both numeric and narrative water quality objectives. Numeric objectives specify allowable concentrations or levels of particular pollutants, while narrative objectives describe the general water quality conditions that must be achieved to protect the designated beneficial uses of a water body. Achieving these standards requires a combination of pollution prevention, watershed management, habitat restoration, and

other protective measures. The Basin Plan for the region outlines a comprehensive set of water quality objectives for surface waters, addressing factors such as bacteria, nutrients, chemical contaminants, color, dissolved oxygen, floating debris, oil and grease, pesticides, pH, radioactivity, sediment, settleable and suspended materials, taste and odor, temperature, toxicity, and turbidity.

Among the various beneficial uses of the Russian River, those related to cold-water fisheries and drinking water supply are considered the most vulnerable and important. Ensuring these uses are safeguarded and, where possible, improved is a central focus of regional water quality management efforts. The Basin Plan (NCRWQCB 2018) lists beneficial uses for the Russian River Hydrological Unit (HU), Middle Russian River Hydrological Area (HA), Geyserville Hydrological Sub-Area (HSU) 114.25), which Maacama Creek is a part of and is summarized in Table 4.10-1, below.

Table 4.10-1 Beneficial Uses

BENEFICIAL USES	GEYSERVILLE HYDROLOGICAL SUB-AREA (114.25)
Municipal and Domestic Supply (MUN)	E
Agricultural Supply (AGR)	E
Industrial Service Supply (IND)	E
Industrial Process Supply (PRO)	E
Groundwater Recharge (GWR)	E
Freshwater Replenishment (FRSH)	E
Navigation (NAV)	E
Hydropower Generation (POW)	P
Contact Water Recreation (REC1)	E
Non-contact Water Recreation (REC2)	E
Commercial and Sport Fishing (COMM)	E
Warm Freshwater Habitat (WARM)	E
Cold Freshwater Habitat (COLD)	E
Preservation of Areas of Special Biological Significance (ASBS)	-
Inland Saline Water Habitat (SAL)	-
Wildlife Habitat (WILD)	E
Rare, Threatened, or Endangered Species (RARE)	E
Marine Habitat (MAR)	-
Migration of Aquatic Organisms (MIGR)	E
Spawning, Reproduction, and/or Early Development (SPWN)	E
Estuarine Habitat (EST)	P
Native American Culture (CUL)	-
Flood Peak Attenuation/Flood Water Storage (FLD)	-
Wetland Habitat (WET)	-
Water Quality Enhancement (WQE)	-
Notes: E = Existing, P =Potential	

To improve surface water quality in Sonoma County, the NCRWQCB establishes total maximum daily loads (TMDL) for water bodies that are impaired by pollutants such as pathogens, fecal indicator bacteria, sediment, elevated temperatures, and mercury (NCRWQCB 2020). In accordance with Section 303(d) of the Clean Water Act (CWA), the State Water Resources

Control Board (SWRCB) compiles and maintains a list of California's impaired water bodies. The 2020-2022 California Integrated Report (Clean Water Act Section 303[d] List / 305[b] Report) (SWRCB 2022) lists the Russian River Hydrologic Unit, Middle Russian River Hydrologic Area, Geyserville Hydrological Sub-Area as pollutant impaired. The impaired pollutants are listed in Table 4.10-2, below.

Table 4.10-2. Russian River Waterbody Impairments

WATER BODY	POLLUTANT	POTENTIAL SOURCE	ESTIMATED TMDL COMPLETION DATE
Russian River Hydrologic Unit, Middle Russian River Hydrologic Area, Geyserville Hydrological Sub-Area	Aluminum	Unknown	2031
	Diazinon	Unknown	2025
	Indicator Bacteria	Unknown	2020
	Sedimentation/Siltation	Flow Alteration/ Regulation/ Modification. Removal of Riparian Vegetation.	2025
	Specific Conductivity	Unknown	2025
	Temperature/Water	Flow Alteration/ Regulation/ Modification. Removal of Riparian Vegetation.	2031

Groundwater

Groundwater quality in Sonoma County is influenced by the characteristics of each groundwater basin, with notable variation across the region. Deterioration in groundwater quality can result from several sources, including the infiltration of agricultural runoff containing fertilizers and pesticides, seepage from both municipal and private wastewater treatment systems, and the percolation of polluted urban stormwater (DWR 2020a).

The proposed Project lies within the Alexander Valley Groundwater Basin (Basin No. 1-054; Figure 4.10-3 (DWR 2025). The Alexander Valley Groundwater Basin has a total storage capacity of 762,000 acre-feet which covers 24,500 acres of Sonoma County (DWR 2004). There are some wells in the basin that have been found to exceed boron concentrations of 0.5 mg/L, which can negatively impact agricultural yields (DWR 2004). No wells sampled in the main basin exceeded primary or secondary maximum contaminant levels (MCLs) for inorganics, radiological constituents, nitrates, pesticides, or volatile organic compounds (VOCs) during the most recent surveys (DWR 2004).

Groundwater basins in the Middle Russian River Watershed have been mapped (Figure 4.10-3). The USGS Russian River Integrated Hydrologic Model (RRIHM) includes groundwater and streamflow observations for the Russian River watershed, documenting groundwater conditions throughout the basin, including the middle section (USGS 2022). Groundwater levels can change over time as a result of seasonal shifts, nearby streams, variations in both surface and underground water movement, rainfall runoff, and other dynamic conditions that might not be

evident during a single site assessment. The Project site is at approximately 159 feet above sea level (NAVD88) (USGS 2025b).

WATER SUPPLY

The Project site primarily gets its water supply from nearby private wells. East of Healdsburg, the Fitch Mountain Water District supplies water to approximately 339 accounts. Fitch Mountain Water District gets its water supply from the City of Healdsburg, which gets its water supply from mainly from the Upper Russian River but also from Lake Sonoma on Dry Creek. The City of Healdsburg also has an agreement with the Sonoma County Water Agency (Sonoma Water) for backup supply.

Groundwater Recharge

After a storm event, water may seep into the ground and into soul as groundwater recharge. The effectiveness of this recharge process depends on the type of soil and the nature of the underlying rock. In Sonoma County, rivers and streams play a crucial role in recharging groundwater, especially where the ground is made up of permeable materials that allow water to pass through easily. This is especially the case within the Project area, where Maacama Creek make this area suitable for such groundwater recharging.

Locally, groundwater is stored in aquifers, geological layers with the capacity to hold significant amounts of water. Regionally, they are stored in groundwater basins. Aquifers that are connected allow water to flow between them, while layers of less permeable or impermeable material, known as aquicludes (often clay), can separate different aquifers.

Groundwater is important in the Project area because it is a source for rural homes, agriculture (especially vineyards), and some small businesses. Groundwater supports not only domestic and agricultural needs but also helps maintain stream flows and ecosystem health in the region.

HAZARDS

Flooding and Dam Inundation

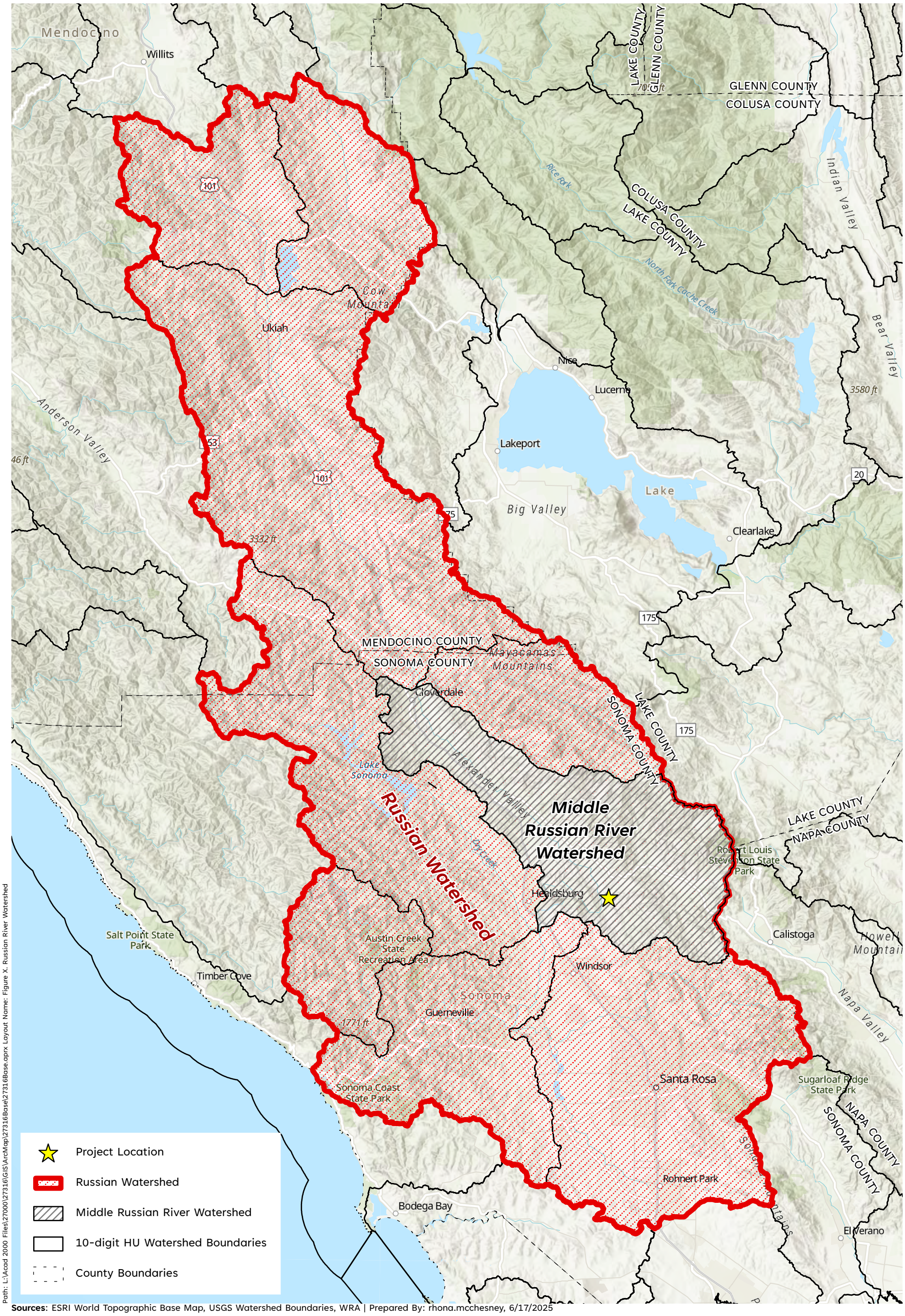
Flooding is the most common natural hazard in Sonoma County, regularly causing significant property damage and prompting numerous local and state disaster declarations. The Russian River, in particular, is prone to frequent and sometimes severe flooding. Flooding can result from a range of causes, such as intense storms, dam failures, tsunamis, and even sea level rise. Dam failure, though rare, poses a significant risk due to the potential for sudden and uncontrolled water release, which can be triggered by heavy rainfall, earthquakes, landslides, or structural problems with the dam itself. Both the Coyote and Warm Springs Dams play a key role in flood mitigation along the Russian River, but a catastrophic failure could inundate large areas downstream, including the project site.

The Project site sits outside the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) Zone AE floodplain, which identifies areas at risk of being flooded by a storm with a one percent chance of occurring in any given year (commonly called the 100-year flood) (FEMA 2025; Figure 4.10-4). The Project site is located in Zone X of FEMA's Flood FIRM map (non-printed panel 06097C0557E). Zone X has a moderate to low risk for flooding meaning the risk of being flooded is reduced but not completely removed. The proposed new bridge would be constructed above the estimated 100-year flood level.

Tsunami and Seiche

Tsunamis are large, powerful waves generated by underwater earthquakes, landslides, or other major disturbances. The Project site is approximately 24 miles inland of the Pacific Ocean and therefore is not included in any official tsunami hazard zones (CGS 2022).

A seiche refers to the rhythmic rise and fall of water levels in a lake or similar body of water, often triggered by shifts in atmospheric pressure or seismic activity. There are no lakes or reservoirs within half a mile of the Project site. Although a significant earthquake could potentially cause a seiche in nearby reservoirs, any resulting overflow would be confined to the immediate low-lying areas surrounding those reservoirs and would not impact the Project site.



Sources: ESRI World Topographic Base Map, USGS Watershed Boundaries, WRA | Prepared By: rhona.mcchesney, 6/17/2025

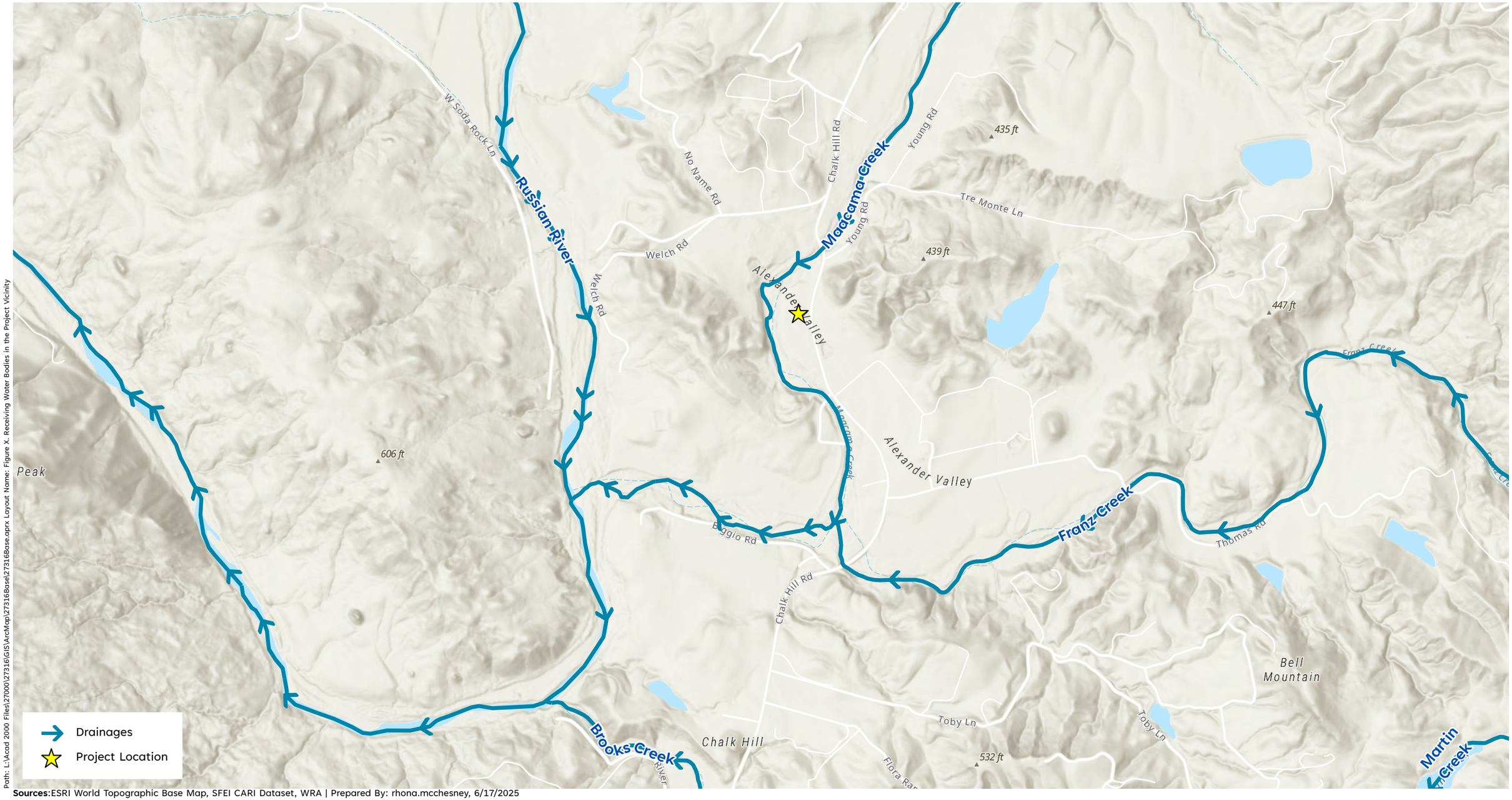
Figure 4.10-1. Russian River Watershed

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 5 10 Miles

N

wra Environmental Consultants



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: Figure X. Receiving Water Bodies in the Project Vicinity

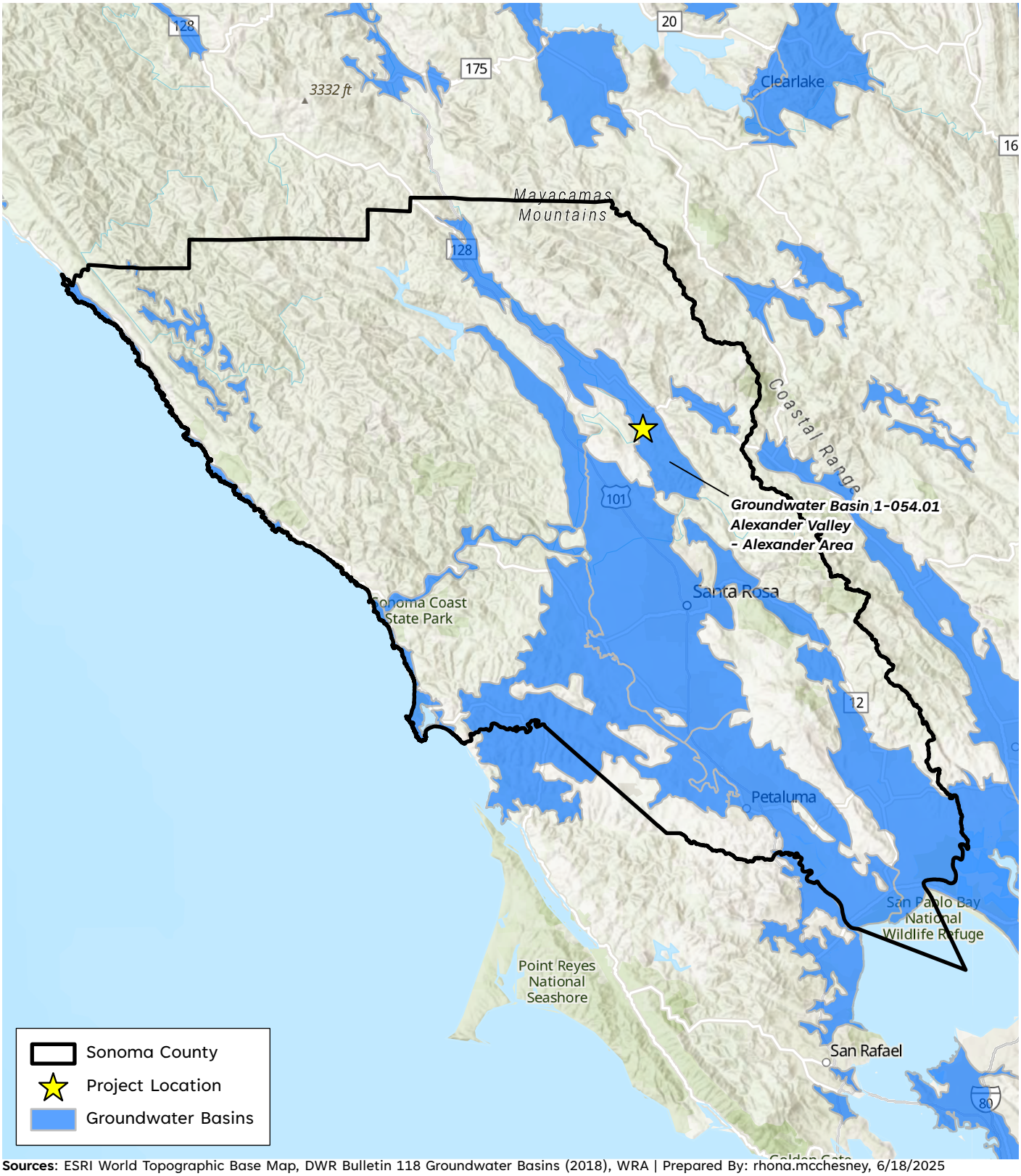
Sources:ESRI World Topographic Base Map, SFEI CARI Dataset, WRA | Prepared By: rhona.mcchesney, 6/17/2025

Figure 4.10-2. Receiving Water Bodies in the Project Vicinity

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 0.5 1 Miles N

wra Environmental Consultants



Sources: ESRI World Topographic Base Map, DWR Bulletin 118 Groundwater Basins (2018), WRA | Prepared By: rhona.mcchesney, 6/18/2025

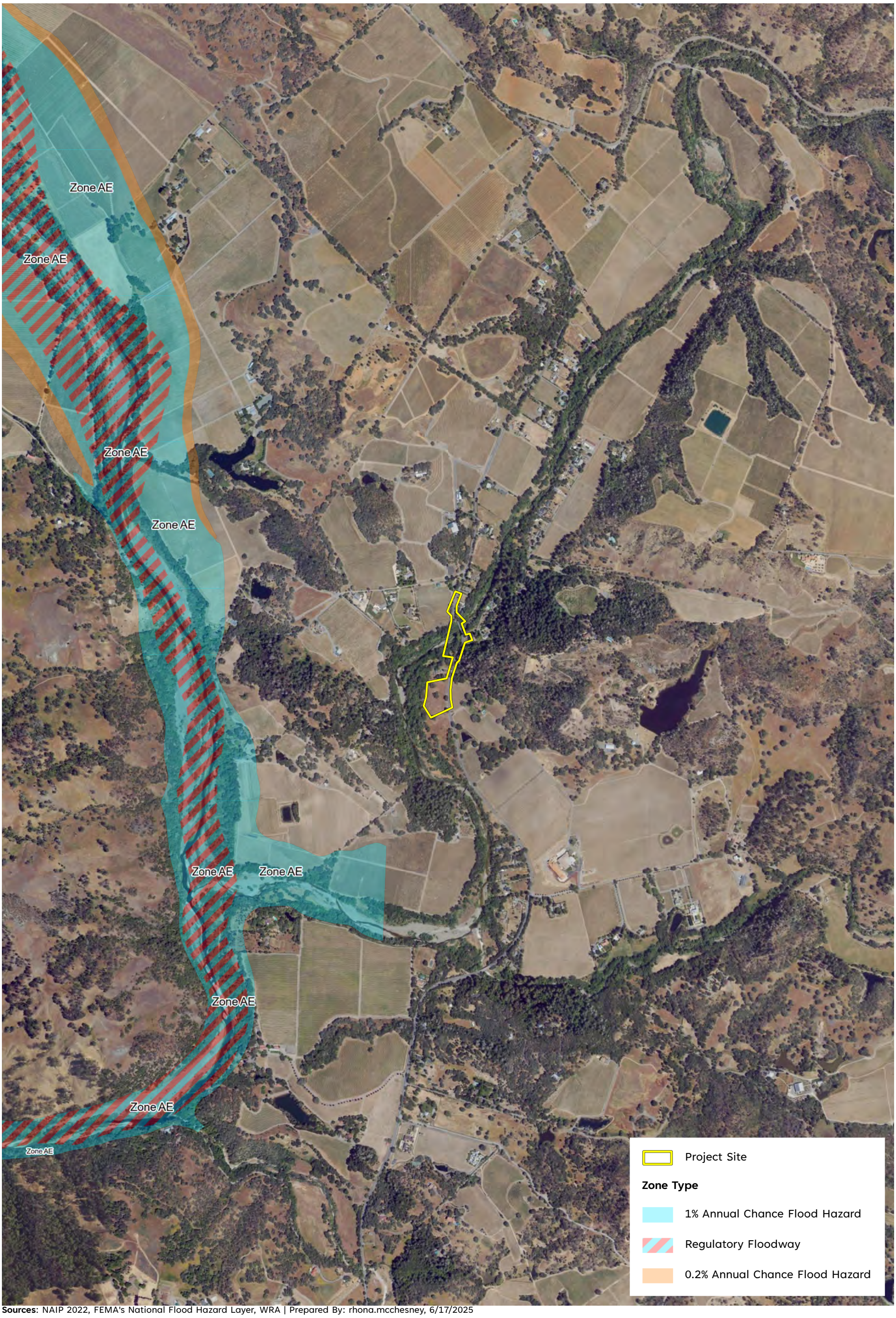
Figure 4.10-3. Groundwater Basins

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 5 10 Miles

N

wra Environmental Consultants



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Sources: NAIP 2022, FEMA's National Flood Hazard Layer, WRA | Prepared By: rhona.mcchesney, 6/17/2025

Figure 4.10-4. FEMA Flood Zones

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 0.25 0.5 Miles

N

wra Environmental Consultants

4.10.2 Regulatory Setting

FEDERAL REGULATIONS

Clean Water Act

Under Section 401 of the Clean Water Act (CWA), any activity that could result in a discharge into U.S. waters must be certified by the Regional Water Quality Control Board (RWQCB) to ensure compliance with state and federal water quality standards. Section 404 of the CWA gives the U.S. Army Corps of Engineers (USACE) authority to regulate the discharge of dredged or fill material into U.S. waters and adjacent wetlands. Discharges must be avoided whenever possible, and if avoidance is not feasible, they must be minimized and mitigated. Section 303(d) of the CWA requires states to develop TMDL for water bodies that do not meet established water quality standards.

Construction projects that disturb more than one acre of land must obtain coverage under the National Pollutant Discharge Elimination System (NPDES) through California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). This permit would require the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which outlines the BMPs the site would use to control and manage stormwater runoff. The SWPPP would include a visual monitoring program, a chemical monitoring program for "non-visible" pollutants if BMPs are not effective, and a sediment monitoring plan if the site discharges directly into a waterbody listed on the 303(d) list for sediment impairment.

Any project that would disturb one or more acre of soil is required to obtain coverage under the State Water Resources Control Board (SWRCB), Order No. 99-08-DWQ, NPDES General Permit No. CAS000002 for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit).

National Flood Insurance Act / Flood Disaster Protection Act

The National Flood Insurance Act of 1968 allowed flood insurance to be an option for property owners for the first time. Later, the Flood Disaster Protection Act of 1973 required property owners in designated Special Flood Hazard Areas to obtain flood insurance. These acts initiated the creation of official floodplain maps and established local oversight of floodplain management, including regulations that limit or prohibit development within areas at risk of flooding.

STATE REGULATIONS

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, enacted in 1969, serves as California's primary law for safeguarding the quality of both surface and groundwater throughout the state. This legislation established the SWRCB and nine Regional Water Quality Control Boards (RWQCBs), granting them broad authority to regulate activities that could impact water quality. Each regional board is responsible for developing and maintaining a Water Quality Control Plan, commonly known as a Basin Plan. These plans identify the beneficial uses of local water bodies, set both narrative and numeric water quality objectives, and outline the strategies needed to protect those uses.

To enforce these standards, the SWRCB and RWQCBs issue waste discharge requirements (WDRs) and, where applicable, NPDES permits. These regulatory tools are used to control the release of pollutants and waste into state waters, ensuring that discharges do not compromise water quality or the designated beneficial uses. Anyone planning to discharge waste that could affect state waters must submit a report to the appropriate water board for review and authorization, as required by the Act.

The Porter-Cologne Act also prohibits the release of pollutants or waste into California's waters without proper authorization, and it empowers the water boards to take enforcement actions, such as issuing cease and desist orders or imposing penalties, against violators. Through this comprehensive regulatory framework, the Act aims to maintain clean, safe water for drinking, recreation, agriculture, wildlife habitat, and other essential uses.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA), enacted in September 2014, established a comprehensive approach for local control over groundwater resources in California. This legislation requires that local or regional agencies, known as Groundwater Sustainability Agencies (GSAs), oversee the management of groundwater in basins identified as medium or high priority. These agencies are responsible for preparing and implementing Groundwater Sustainability Plans (GSPs) that outline strategies to achieve long-term balance between groundwater extraction and recharge, aiming to prevent issues such as chronic overdraft, land subsidence, and water quality degradation. The project site is situated within the Alexander Valley Groundwater Basin (DWR 2025).

Antidegradation Policy

California's antidegradation policy, officially titled the Statement of Policy with Respect to Maintaining High Quality Waters in California, is designed to prevent the unnecessary decline of both surface and groundwater quality. This policy safeguards water bodies whose current quality exceeds the minimum required to support their designated beneficial uses. Under this policy, any proposed activity that could negatively impact water quality must demonstrate that it serves the greatest good for the people of California, does not unreasonably compromise existing or future uses of the water, and does not cause water quality to fall below the standards set forth in state water quality plans and regulations.

Cobey-Alquist Floodplain Management Act

The Cobey-Alquist Floodplain Management Act (Water Code Section 8400 et seq.) supports the National Flood Insurance Program by promoting proactive floodplain management at the local level. It encourages cities and counties to develop and implement land use policies and regulations aimed at minimizing flood risks and safeguarding both residents and property. Additionally, the Act outlines specific criteria that local jurisdictions must satisfy in order to qualify for state funding related to flood control projects.

Urban Water Management Planning Act

The Urban Water Management Planning Act (Water Code, Section 10610 et seq.), enacted in 1983, requires that California's urban water providers create comprehensive plans to ensure the responsible and efficient use of their water resources. Section 10631.1 of the Act also requires making water services accessible and affordable for low-income households. Urban water providers must update their Urban Water Management Plans (UWMPs) every five years, outlining

both immediate and long-term strategies for managing water demand and addressing future growth. The Sonoma Water District most recently revised its UWMP in 2020 (Sonoma Water 2020).

State Water Conservation Requirements

State Water Conservation Executive Order B-37-16, introduced in May 2016, is a comprehensive approach to improve water use efficiency through a more long-term approach throughout California. This order aims to enhance the state's ability to withstand drought by implementing ongoing water conservation strategies such as reporting monthly water usage, establishing urban water goals, minimizing water loss from distribution centers, prohibiting wasteful water practices, and improving urban and agricultural water management and response plans.

Based on monthly water use reporting, most urban water providers demonstrated they had enough water to meet demand even if dry conditions persisted for three more years and thus were exempt from statewide conservation requirements.

On February 8, 2017, SWRCB adopted an emergency water conservation regulation to revise and extend the May 2016 regulation. This revision allowed eligible water providers to submit or update their assessments of water supply reliability.

REGIONAL AND LOCAL REGULATIONS

Municipal Separate Storm Sewer System

RWQCBs are responsible for granting permits that regulate stormwater runoff. In the North Coast Region, sites must comply with the Phase I Municipal Separate Storm Sewer System (MS4) permit, identified as Order R1-2015-0030 (County of Sonoma 2020). The County of Sonoma, the City of Santa Rosa, and Sonoma Water are tasked with administering and enforcing the requirements of this MS4 permit. The MS4 permit requires implementing best management practices (BMPs) designed to minimize the release of pollutants from municipal stormwater drainage systems.

Low Impact Development Manual

The 2017 Storm Water Low Impact Development Technical Design Manual (LID Manual) serves as the primary resource for incorporating permanent stormwater BMPs into project planning and design. This manual supersedes the 2005 Standard Urban Storm Water Mitigation Plan and satisfies Order R1-2015-0030, NPDES Permit CA0025054. The City of Santa Rosa is responsible for maintaining the LID Manual, while both the City and the County of Sonoma - acting as co-permittees - ensure its application to development projects, with the County overseeing its use in unincorporated areas (City of Santa Rosa 2017).

Sonoma County General Plan

The Sonoma County General Plan Water Resources Element and Public Safety Element contains the following relevant policies related to protecting the County's water supply, water quality, and protecting against flood hazards:

> **Policy WR-1b:** Design, construct, and maintain County buildings, roads, bridges, drainage and other facilities to minimize sediment and other pollutants in stormwater flows. Develop and implement "best management practices" for ongoing maintenance and operation.

Policy WR-1c: Prioritize stormwater management measures in coordination with the RWQCB direction, focusing first upon watershed areas that are urbanizing and watersheds with impaired water bodies. Work cooperatively with the RWQCBs to manage the quality and quantity of stormwater runoff from new development and redevelopment in order to:

1. Prevent, to the maximum extent practicable, pollutants from reaching stormwater conveyance systems.
2. Ensure, to the maximum extent practicable, that discharges from regulated municipal storm drains comply with water quality objectives.
3. Limit, to the maximum extent practicable, stormwater from post development sites to pre-development quantities.
4. Conserve and protect natural areas to the maximum extent practicable.

Policy WR-1g: Minimize deposition and discharge of sediment, debris, waste and other pollutants into surface runoff, drainage systems, surface water bodies, and groundwater.

Policy WR-1h: Require grading plans to include measures to avoid soil erosion and consider upgrading requirements as needed to avoid sedimentation in stormwater to the maximum extent practicable.

Policy WR-1q: Require new development projects to evaluate and consider naturally occurring and human caused contaminants in groundwater.

Policy WR-4a: Encourage disposal methods that minimize reliance on discharges into natural waterways. If discharge is proposed, review and comment on projects and environmental documents and request that projects maximize reclamation, conservation and reuse programs to minimize discharges and protect water quality and aquifer recharge areas.

Policy WR-4g: Require that development and redevelopment projects, where feasible, retain stormwater for on-site use that offsets the use of other water.

Policy PS-2a: Maintain available information on flooding and flood hazards in the appropriate County departments.

Policy PS-2f: Preserve floodplain storage capacity by avoiding fill in areas outside of the 100-year FEMA special flood hazard area that retain or could retain flood waters.

Policy PS-2m: Regulate development, water diversion, vegetation management, grading, and fills to minimize any increase in flooding and related damage to people and property.

Policy PS-2o: Costs for drainage facilities to handle the surface runoff from new development shall be the responsibility of the new development.

Policy PS-2p: Require that design and construction of drainage facilities be subject to the review and approval of the Permit and Resource Management Department.

Water Quality Control Plans

The NCRWQCB completed a Water Quality Control Plan for the North Coast Region in June 2018 (NCRWQCB 2018). This plan applies to the project area. Water Quality Control Plans (also known as “Basin Plans”) identify the beneficial uses for water bodies within the respective regions and

provides implementation actions and strategies to achieve the water quality objectives set forth in the Water Quality Control Plans.

4.10.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;*

b) *Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;*

c) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*

   i. *result in substantial erosion or siltation on- or off-site;*

   ii. *substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;*

   iii. *create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;*

   iv. *impede or redirect flood flows;*

d) *In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or,*

e) *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.*

APPROACH TO IMPACT ANALYSIS

This impact assessment evaluates the existing conditions at the Project location, focusing on surface water, groundwater, and floodplain characteristics. It examines how construction, ongoing operations, and maintenance activities might interact with these environmental features. Where potential adverse effects are identified, the analysis proposes mitigation measures to prevent or reduce those impacts as much as possible.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction

Project construction activities would involve demolition of the existing bridge, constructing the replacement bridge, relocating utilities installing retaining walls, and implementing scour countermeasures such as installation of vegetated rock slope protection and large logs with root wads. Construction activities would involve excavating, grading, constructing temporary falsework, creating stream diversions, placing piles and abutments, building temporary work pads over the creek, minor vegetation removal within the creek, compacting soil, and stockpiling earth materials which could disturb the ground and increase the risk of soil erosion. After a rain event, water flowing from the construction site could include pollutants and loose sediments which could travel downstream and enter waterways, degrading water quality.

Construction activities would also involve the use of hazardous materials such as diesel, gasoline, lubricants, hydraulic and transmission fluids, antifreeze, and cement-based products for the operation of construction vehicles and equipment. *Section 4.9, Hazards and Hazardous Materials*, outlines the proper handling, storage, and disposal of such materials as regulated by the County, state, and federal entities. The Project is required to follow these guidelines to control erosion and protect water quality regulations during construction as requirements of the SWRCB Construction General Permit. Because the Project would disturb over one acre of land, a SWPPP must also be prepared and implemented throughout Project construction. The SWPPP would identify BMPs for erosion and sediment control and would also include measures to cleanup and respond to any accidental hazardous material spills or leaks.

By following these regulatory requirements and implementing the SWPPP, the risk of soil erosion and pollutant runoff entering nearby water bodies would be significantly reduced. Further, Mitigation Measure HYDRO-1 would be implemented, which includes BMPs for erosion and sediment control, spill prevention, riparian restoration, and protection of jurisdictional waters. Measures include implementing erosion control measures (e.g., seed and straw, jute mesh) on disturbed surfaces and exposed soils; inspecting the Project site after the first heavy rain of the construction season and taking appropriate remedial actions, if needed; installing high-visibility construction fencing and silt fencing around environmentally sensitive areas; placing spill control absorbent material underneath equipment at all times to capture potential leaks, and others. With implementation of the SWPPP and the additional measures described in Mitigation Measure HYDRO-1, construction of the Project would not violate any water quality standards or waste discharge requirements, or otherwise substantially degrade surface or ground water quality. The impact would be ***less than significant with mitigation incorporated***.

Operation and Maintenance

The Project would increase impervious surface area by approximately 0.17 acre as a result of the new paved roadway approaches and the replacement bridge, which would be wider than the existing bridge to meet AASHTO standards. The increase in impervious surface area would not substantially change drainage patterns in a way that could contribute additional substantial sources of polluted runoff. The south creek bank downstream of the existing bridge underwent significant erosion during the 2018-2019 storm season. The Project would stabilize the area by installing permanent scour countermeasures on the south creek bank. The earthen creek banks and rock slope protection area would be revegetated with native vegetation. Therefore, the Project would improve the existing erosion issue which would result in decreased sedimentation of Maacama Creek.

The Project would be required to comply with the 2015 Phase I Municipal Storm Sewer Systems (MS4) Permit issued by the NCRWQCB (Order No. R1-2015-0030), or any updated MS4 permit that may be in effect at the time of construction. This permit mandates the use of low impact development (LID) practices, which for this Project means capturing and treating stormwater runoff to prevent increases in runoff rates and to improve water quality from paved surfaces. Stormwater runoff from the new bridge would be diverted to bioretention areas (bioswales) at the north and south bride approaches.

By adhering to the regulatory requirements described above, operation of the Project would not violate water quality standards or waste discharge requirements, nor would it cause significant degradation of water quality in local waterways. The impact would be ***less than significant***.

Mitigation Measures

Mitigation Measure HYDRO-1: Water Quality Protection

The following measures shall be implemented to protect water quality during Project construction:

- By October 15 following each construction season, the County shall require that all disturbed areas around the permanent and temporary bridge abutments be re-graded to match the surrounding topography. Seed and straw shall be placed on these and all other disturbed areas in the Project site. A jute mesh type or equivalent matting shall be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the County Permit and Resource Management Department (PRMD) and the DPI.
- The Project site shall be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season following construction. During each visit, areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken.
- Prior to any clearing, grubbing, pruning, or groundbreaking activity, the limits of construction shall be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas, protect all riparian vegetation beyond that which must be cleared for construction access, and prevent any equipment from unnecessarily extending the work area or entering the wetted channel. In addition, silt fencing shall be installed at the base of the construction fencing to prevent debris from entering the creek. All fencing shall be removed upon Project completion.
- All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, refueling and maintenance, must occur outside the creek channel. No equipment will be washed where runoff could enter the creek.
- All refueling and maintenance of equipment, other than stationary equipment, must occur outside the creek's top-of-bank. Receptacles containing fuel, oil, or any other substance that may adversely affect aquatic resources must be stored outside of the channel. Any hazardous chemical spills must be cleaned immediately.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material shall be placed underneath this equipment at all times to capture potential leaks.
- The County will not allow any motorized equipment to be left within the creek channel (top of bank to top of bank) overnight, unless a container or similar method is securely placed

beneath the equipment to catch any fluid leakage. All contained fluids will be disposed of in a permitted manner.

- Prior to construction, the contractor will be required to prepare an Accidental Spill Prevention and Cleanup Plan. This plan must require spill control absorbent material, for use beneath stationary equipment, to be present on-site and available at all times.
- The County shall require the contractor to use a drilling mud and slurry seal that is nontoxic to aquatic life for all drilling activities related to construction of Project. All drilling muds and fluid shall be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting must be collected and not be allowed to flow into the creek.
- No equipment, including concrete trucks, will be washed within the channel of the creek, or where wash water could flow into the channel. Prior to Project construction, the contractor shall establish a concrete washout area for concrete trucks in a location where wash water will not enter the Maacama Creek. The washout area will follow the practices outlined in the San Francisco Bay RWQCB Erosion and Sediment Control Field Manual (page 107-108, July 1999) or equivalent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of PRMD and the DPI.
- All drainage inlets within the project site shall be protected from receiving polluted stormwater through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- All water that comes in contact with wet concrete must be pumped directly into tanks and disposed of at a permitted location.
- Water encountered during construction of the bridge foundations shall be pumped upslope for disposal on nearby uplands in a way that would prevent it from flowing back into the creek or pumped directly into tanks and disposed of at a permitted location.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The Project would require limited water use, mainly for activities such as controlling dust during construction and irrigating new plantings during the post-construction revegetation phase. The slight increase in paved surfaces from the new bridge and its approaches is not expected to meaningfully impact the area's ability to recharge groundwater. Additionally, the Project would not result in a higher overall demand for water, which in this region is primarily supplied by local groundwater resources. Compliance with existing requirements would ensure that impacts to groundwater supplies and groundwater recharge would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) result in substantial erosion or siltation on- or off-site;

Construction activities would include stockpiling materials, grading, excavating, paving, and other earth-moving operations that could temporarily disrupt the site's natural drainage patterns. However, as detailed in Impact (a), adherence to the SWRCB's NPDES Construction General Permit and MS4 General Permit requirements would help control erosion and siltation during the construction period. In addition, Mitigation Measure HYDRO-1 would be implemented which contains BMPs for stream protection and erosion control. BMPs would include placing jute mesh on exposed ground surfaces and the placement of straw wattles to prevent sediment from entering the creek or drainage inlets. Once construction is finished, the Project is anticipated to result in long-term decreased erosion and siltation because the Project would stabilize areas along the creekbanks by implementing scour countermeasures. With compliance with applicable regulations and implementation of HYDRO-1, the Project would not result in substantial erosion or siltation on- or off-site. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure HYDRO-1 would be implemented to reduce potential impacts to a less-than-significant level.

ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The Project area drains to Maacama Creek and is located in Zone X of the FEMA's FIRM (non-printed panel 06097C0557E), which has a moderate to low risk for flooding. The Project would modify existing drainage patterns on-site altering the approach roadways and constructing a new bridge. The Project would result in an increase of approximately 0.17 acre of impervious surface area. Surface runoff from impervious surfaces would be diverted into a bioretention area or roadside ditches. The small increase in impervious surfaces would not substantially alter drainage patterns in a manner that could result in flooding or contribute additional substantial sources of runoff. Therefore, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

iii) create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Construction

As discussed above in Impact c-ii), the Project would result in an approximately 0.17 acre increase in impervious surface area. Surface runoff from impervious surfaces would be diverted into a bioretention area or roadside ditches. The Project site is in a rural area that drains to Maacama Creek; no intricate stormwater drainage systems are present. The small increase in impervious surfaces would not substantially alter drainage patterns in a manner that could exceed the capacity of stormwater drainage systems or provide substantial additional sources of runoff. Further, the use of BMPs from the LID Manual is specifically intended to manage

stormwater runoff and prevent contaminants from reaching Maacama Creek. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

iv) impede or redirect flood flows?

Construction

As described in Impact c-ii), the Project site is located in FEMA Flood Zone X, which has a low to moderate risk of flooding. The Project would not impede or redirect flood flows; stormwater runoff would be diverted into a bioretention area or roadside ditches. The new bridge would be elevated above the 100-year flood level. Therefore, the Project would not impede or redirect flood flows. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Construction

The Project site is outside of both tsunami and seiche hazard zones. The Project site is located in FEMA Flood Zone X, which has a low to moderate risk of flooding. During construction, there is a possibility that pollutants could be released, which could runoff into nearby waterways if the area is inundated. However, the Project would be required to implement a SWPPP, which would contain measures to prevent and respond to any accidental spills. Further, Mitigation Measure HYDRO-1 would be implemented, which contains further measures to prevent pollutant release into Maacama Creek, such as silt fencing, erosion control, and precautionary measures for equipment fueling. With compliance with applicable regulations and implementation of HYDRO-1, the Project would not risk release of pollutants due to Project inundation. Further, all construction work in Maacama Creek would take place outside of the rainy season, which further reduces the likelihood of inundation occurring at the Project site. Therefore, construction of the Project would not risk release of pollutants due to Project inundation. The impact would be ***less than significant with mitigation incorporated***.

Operation

Since the new bridge would be constructed at a higher elevation than the current one, the likelihood of the structure being submerged during major flood events would be reduced. As such, operation of the project would result in a reduced likelihood for flood-generated pollutant release into Maacama Creek, compared to existing conditions. Stormwater runoff from the new bridge would be diverted to bioretention areas (bio-swales) at the north and south bride approaches. In addition, the Project would implement creekbank stabilization measures which would reduce erosion, resulting in a long-term decrease in pollutant runoff and sedimentation of Maacama Creek. Therefore, the impact of Project operation would be ***less than significant***.

Mitigation Measures

Mitigation Measure HYDRO-1 would be implemented to reduce potential impacts to a less-than-significant level.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Project site falls under the jurisdiction of the NCRWQCB's Water Quality Control Plan, which sets quantitative and qualitative objectives for water quality. Since the Project involves work within the stream channel, there is a potential for short-term water quality impacts. However, as described in Impact a) above, the Project would comply with all applicable local, state, and federal regulations related to water quality. In addition, the Project would implement Mitigation Measure HYDRO-1, which contains additional measures for water quality protection. With compliance with applicable regulations and implementation of HYDRO-1, the Project would not interfere with or hinder the goals of the Water Quality Control Plan; the impact would be ***less than significant with mitigation incorporated***.

The Project site is within the Alexander Valley Groundwater Basin – Alexander Area subbasin, which was identified as a medium-priority basin by the 2018 Sustainable Groundwater Management Act (SGMA) Basin Prioritization, but was switched to a very low priority basin under the 2019 Phase I Final Basin Prioritization (DWR 2020b). Under the SGMA, high- and medium-priority basins are required to form Groundwater Sustainability Agencies (GSAs) and develop Groundwater Sustainability Plans (GSPs). Since the Alexander Valley Groundwater Basin – Alexander Area subbasin, is not a high- to medium-priority basin, no GSP has been developed for this area. Additionally, the Project would not draw upon groundwater resources or meaningfully reduce groundwater infiltration by expanding impervious surface area. Therefore, the Project would not obstruct implementation of a sustainable groundwater management plan. The impact would be ***less than significant***.

Mitigation Measures

Mitigation Measure HYDRO-1 would be implemented to reduce potential impacts to a less-than-significant level.

4.11 Land Use and Planning

This section describes the existing setting of the Project site related to land use and planning, identifies associated regulatory requirements, analyzes potential impacts related to the division of established communities and conflicts with land use policies, and identifies mitigation measures as needed to reduce the land use impacts of the proposed Project.

4.11.1 Setting

EXISTING LAND USES

The Project site consists of the existing one-lane bridge that carries Chalk Hill Road over Maacama Creek. The existing bridge has County Landmark status and is formally zoned with the Historic Combining District (HD), described in more detail below under the *Regulatory Setting* section.

The Project site includes portions of Chalk Hill Road, Maacama Creek, and surrounding parcels. The majority of the proposed right-of-way for bridge replacement work is located within APN 132-080-023, with small portions crossing into APNs 132-060-013, 132-080-022, 132-060-011 and 132-080-003. The Project site has a General Plan land use designation of Land Intensive Agriculture (LIA). The zoning designation is LIA with a Scenic Resource (SR) combining zone along Chalk Hill Road, a Riparian Corridor (RC 100/50) and Oak Woodland (OAK) combining zone along Maacama Creek, and Historic District (HD) along the Chalk Hill Road bridge. APN 132-060-013 also has a Valley Oak Habitat (VOH) combining zone and an Accessory Dwelling Unit Exclusion (Z) combining zone.

4.11.2 Regulatory Setting

STATE REGULATIONS

Local Agency Formation Commissions

The Cortese Knox Hertzberg Local Government Reorganization Act of 2000 (Government Code Section 56000 et seq.) establishes the procedures for forming and modifying local agency boundaries in California. Under this law, each county is required to have a Local Agency Formation Commission (LAFCO), which is responsible for promoting orderly growth, preserving open space, and discouraging urban sprawl through the regulation of jurisdictional boundaries. Although LAFCOs do not have direct authority over land use decisions, their actions determine which local agency will assume planning and service responsibilities for newly developed or reorganized areas. LAFCOs oversee various boundary-related actions, such as annexations, incorporations, reorganizations, and the detachment of land from special districts. They are also responsible for establishing and updating spheres of influence for cities and special districts, which represent the likely future service and growth areas for those agencies.

Planning and Zoning Law

California law requires every city and county to adopt a general plan to guide the physical development of land within its planning boundaries (Government Code Sections 65300 to 65404). The general plan must include several mandatory elements: land use, housing, circulation, open space, conservation, noise, and safety. Cities and counties may also include additional elements

based on local priorities. The circulation element must be aligned with the land use element to ensure coordinated planning.

Zoning authority is granted through the police power of cities and counties, as well as through the State's Planning and Zoning Law, which establishes minimum standards for local zoning regulations. A city's or county's zoning code contains detailed rules that implement general plan policies at the parcel level. It defines development standards, permitted uses, and zoning districts within the jurisdiction. Since 1971, state law has required that zoning codes be consistent with the general plan of the city or county.

Sustainable Communities and Climate Protection Act (SB 375)

The Sustainable Communities and Climate Protection Act (SB 375) supports California's efforts to reduce greenhouse gas emissions by promoting the integration of transportation, housing, and land use planning. Under this law, the CARB set regional greenhouse gas reduction targets for the years 2020 and 2035 for each of the state's 18 metropolitan planning organization regions in 2010, with updated targets issued in 2018. To meet these targets, each region must develop a Sustainable Communities Strategy (SCS) as part of its regional transportation plan. The SCS outlines land use, housing, and transportation strategies that, if implemented, are intended to help the region achieve its emissions goals. The law also offers incentives to encourage development consistent with the SCS, including relief from certain environmental review requirements under the CEQA for qualifying residential and mixed-use projects (Public Resources Code Sections 21155, 21155.1, 21155.2, 21159.28).

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The Sonoma County General Plan Land Use Element contains the following relevant policies related to land use and planning:

> **Policy LU-4b:** Use the levels of service in Objectives CT-4.1, CT-4.2, and CT-4.3 of the Circulation and Transit Element to determine whether or not congestion is exceeding the desired level of service on County roadway segments. Use area and/or project traffic analyses to determine whether intersection impacts or other localized congestion may also affect these desired levels of service.
>
> **Policy LU-4c:** Assure that new development occurs only when it conforms to Policies CT-5f and CT-5g of the Circulation and Transit Element.
>
> **Policy LU-4d:** Assure that physical services and infrastructure will accommodate the projected amount of growth authorized by the Land Use Element. Prepare facility master plans or equivalent documentation based upon the holding capacity of the land use plan plus generally accepted engineering contingency factors. Periodically, but no less than every 5 years, assess the status of public services in relation to growth. Encourage public facilities planning and design beyond the 2020 horizon if the additional capacity does not induce increased pressure for population or employment growth in excess of that projected in the Land Use Plan. Facility plans shall clearly delineate the portion of capacity allocated to growth after 2020. Work with the cities, and, where applicable, other counties to assure that such services are adequate for existing and future residents. Use proposed annexations, redevelopment agreements, revenue sharing agreements, and

the CEQA process as tools to ensure that development within cities pay its fair share toward provision of these services.

Policy LU-4e: Prepare a social and administrative services master plan, which sets forth the projected countywide needs for these services and costs. Work with the cities to assure that such services are adequate for existing and future residents. Use proposed annexations, redevelopment agreements, revenue sharing agreements, and the CEQA process as tools to ensure that incorporated development pay its fair share toward provision of these services.

Policy LU-7c: Prohibit new permanent structures within any floodway. Require that any development that may be permitted within the flood plain to be raised above the 100-year flood elevation.

Policy LU-11b: Encourage all types of development and land uses to use alternative renewable energy sources and meaningful energy conservation measures.

Policy LU-11c: Encourage the use of alternatives to harmful chemicals, heavy metals, and synthetic compounds.

Policy LU-11d: Encourage methods of landscape design, landscape and park maintenance, and agriculture that reduce or eliminate the use of pesticides, herbicides, and synthetic fertilizers; and encourage the use of compost and conservation of water.

Policy LU-11e: Encourage use of compact and mixed-use development that minimizes the need to drive, re-uses existing infill and brownfield sites that have been reclaimed and remediated before using open land, and avoids sprawl.

Policy LU-11f: Encourage conservation of undeveloped land, open space, and agricultural lands, protection of water and soil quality, restoration of ecosystems, and minimization or elimination of the disruption of existing natural ecosystems and flood plains.

Policy LU-11g: Encourage development and land uses that reduce the use of water. Where appropriate, use recycled water on site, and employ innovative wastewater treatment that minimizes or eliminates the use of harmful chemicals and/or toxics.

Sonoma County Zoning Ordinance

Zoning serves as the primary tool for implementing the land use policies outlined in the County's General Plan. It not only defines the types of uses allowed on a property but also sets development standards, including those related to building intensity, height, setbacks, and parking. When development projects are submitted to the County for review, they are typically assessed for alignment with applicable zoning regulations.

The County's Zoning Ordinance translates the goals of the General Plan into enforceable regulations by establishing how land and structures can be used in unincorporated areas. It outlines different zoning districts, permitted land uses, development criteria, and environmental performance standards. These zoning regulations apply to all land uses, subdivisions, and developments within the County.

The overarching aim of the Zoning Ordinance is to safeguard and enhance public health, safety, welfare, and the overall quality of life for residents and businesses. Its specific objectives include:

1. Promoting orderly and efficient land use;

2. Preserving the character and economic vitality of agricultural, residential, commercial, and industrial areas;
3. Ensuring public safety through the regulation of land and structure uses; and
4. Conserving the County's scenic, recreational, and natural resources.

Descriptions of the base zoning districts and combining zoning districts that are present within the Project site are provided below.

Land Intensive Agriculture (LIA)

The LIA base zoning district is meant to enhance and protect lands best suited for permanent agricultural use and capable of relatively high production per acre of land. Allowable land uses in the LIA district generally include agricultural crop production and cultivation, animal keeping, composting, farm retail sales and stands, indoor crop cultivation, and nursery uses. Other uses may be allowed conditionally or with permit approval, including agricultural processing, livestock feed yards, mushroom farming, tasting rooms, animal product processing, and fertilizer plants.

Scenic Resources (SR)

The SR combining zoning district aims to preserve the visual character and scenic resources of lands in the County and to implement the provisions of the General Plan Open Space and Resource Conservation Element. The SR district applies to properties where maintaining scenic character is a priority, particularly in areas visible from public roads. Most development within the SR district is subject to administrative design review to ensure that new structures are screened from public view by natural landforms, existing vegetation, or native, fire-resistant plantings. Permitted uses generally follow the underlying zoning district, but additional requirements apply to the design, location, and screening of structures, fences, and accessory facilities to minimize visual impacts and maintain the scenic quality of the area. The SR district allows all structures, except certain telecommunications facilities, located within community separators, scenic landscape units, and along scenic corridors illustrated on Figures OS-5a through OS-5i of the General Plan Open Space and Resource Conservation Element and included within the SR district, provided they follow the provisions outlined in Zoning Code.

Riparian Corridor (RC 100/50)

The RC combining zoning district is established to protect and enhance the biotic resource communities and critical habitat areas within and along designated streams and their adjacent lands. The RC district applies to the stream bed, banks, and an adjoining streamside conservation area on each side of the stream measures from the top of the higher bank. The minimum setbacks for development and agricultural activities are indicated by the zoning code (e.g., RC 100/50 means a 100-foot setback for development and a 50-foot setback for agricultural cultivation). Permitted uses within the RC district, subject to compliance with the base zoning and required permits, generally include agricultural cultivation (with best management practices), stream maintenance and restoration, levee maintenance, selective vegetation removal, fire fuel management, bikeways and trails, certain parks, temporary seasonal docks, and timber operations under an approved plan. Activities must avoid removing existing riparian vegetation unless specifically allowed, and new development within 100 feet of the corridor is only permitted when no feasible alternatives exist, with measures to minimize vegetation removal. The overall goal of the RC district is to balance land use needs with the

preservation of riparian vegetation, water quality, habitat, floodplain management, and other ecological functions.

Oak Woodland (OAK) and Valley Oak Habitat (VOH)

The purpose of the OAK and VOH combining zoning is to protect and enhance native oak woodlands and valley oak habitats, which are recognized as sensitive and valuable natural resources. The OAK district implements Sonoma County General Plan Policy OSRC-7I, related to oak woodlands, and the VOH district implements Policy OSRC-7m, related to valley oak habitat. These districts apply to parcels containing oak woodlands or valley oak woodlands as identified in County vegetation maps and zoning overlays. Permitted uses in both districts generally follow the underlying zoning of the parcel, but with added protections for oak woodland and valley oak habitat. Activities such as defensible space management, conservation-based restoration, and maintenance of existing agricultural operations are exempt from additional permitting requirements.

Projects on parcels that contain over 0.5-acre of OAK zoning may require a zoning permit. A one-time woodland impact or type conversion of up to 0.5 acre of oak woodland is allowed with a zoning permit, subject to the requirements of Section 26-67-050. The VOH district requires mitigation measure for removal of oak trees, including retention of other oaks, replacement plantings, or an in-lieu fee. These portions of the zoning code are not applicable to County Public Infrastructure projects; however, they are used as a guide for determining impacts and appropriate mitigation measures.

Historic District (HD)

In 1998, the Board of Supervisors established the Historic Bridge Thematic District (HD) through Resolution 98-0046, concluding that this designation would provide long-term protection for historically significant bridges and help ensure that any modifications would not compromise their historic character. The Board also adopted specific procedures to guide the Landmarks Commission in reviewing proposed alterations to or removals of bridges within the HD designation. The Chalk Hill Bridge over Maacama Creek was designated within the HD as part of this resolution, along with nine other bridges in the County, including the Arnold Drive, Big Sulphur creek, Clark's Crossing, Guerneville, Hacienda, Haupt Creek, Lambert, North Fork, and Wohler bridges.

The HD combining zoning district aims to protect those structures, sites, and areas that are remainders of past eras, events, and persons important in local, state, or national history, or which provide significant examples of architectural styles of the past, or which are unique and irreplaceable assets to the county and its communities. The HD zone applies to an individual structure or an integrated group of structures on a single lot or lots having a special historical, architectural, or aesthetic interest of value as a historic structure. The HD zoning is combined with the base zoning of the parcels and aims to maintain the area's historic integrity while allowing appropriate use and development. No zoning permit alterations (including demolition) of a structure within the boundaries of an HD and no zoning permits authorizing construction of a new building within an HD is allowed unless granted approval by the County landmarks commission.

Accessory Dwelling Unit Exclusion (Z)

The Z combining zoning district is a zoning overlay that prohibits the construction of Accessory Dwelling Units (ADUs) on properties where it applies. This district was originally established as a precautionary measure to limit ADUs in areas that might not be able to support them,

particularly on certain agricultural parcels. In the Z District, ADUs are not permitted, even if the underlying zoning would otherwise allow them.

4.11.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Physically divide an established community; or,*

b) *Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.*

APPROACH TO IMPACT ANALYSIS

The General Plan consistency analysis describes existing regional and local plans and policies and is intended to fulfill the requirements of CEQA Guidelines Section 15125(d). The emphasis of the analysis is on plan inconsistency and potential conflicts between the Project and existing applicable land use plans, and whether any inconsistencies would represent or result in significant environmental effects. The Project is considered consistent with the provisions of the identified regional and local plans if it meets the general intent of the applicable plans and does not conflict with any directly applicable policies. A given project need not be in perfect conformity with each and every policy nor does state law require precise conformity of a proposed project with every policy or land use designation.

For an impact to be considered significant, any inconsistency would also have to result in a significant adverse change in the environment not already addressed in the other resource chapters of this EIR.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Physically divide an established community?

Short-term construction impacts would be limited to areas within the Project site. Improvements to utilities or transportation infrastructure would be constructed within roadway rights-of-way and would not block access between existing communities. As described further in *Section 4.17, Transportation,* access to roadways and driveways would be maintained at all times throughout construction activities. Therefore, existing roadways would not be blocked, and construction would not limit access to a community or restrict movement within a community.

Once completed, the new bridge will continue providing access to vehicles and bicyclists over Maacama Creek. Therefore, the Project would not physically divide an established community. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The Sonoma County General Plan contains various policies aimed to mitigate impacts of development projects. As described in *Section 4.4, Biological Resources; Section 4.6, Energy; Section 4.13, Noise*; and *Section 4.17, Transportation*, the Project would not conflict with policies of the General Plan related to biological resources, energy use, noise, or transportation. The Project is consistent with the goals, objectives, and policies of the General Plan Circulation and Transit Element aimed at rehabilitating transportation infrastructure for safety purposes.

The Project site is within the HD, SR, OAK, VOH, RC and Z combining zoning districts. The HD district requires that the County landmarks commission grant approval to any zoning permit alterations (including demolition) of a structure or construction of a new structure within the boundaries of an HD. The Project was presented to the Landmarks Commission on Tuesday, November 18, 2025. A follow up letter was sent to the Landmarks Commission on March 13, 2026, that described proposed mitigation measures for the removal of the historic bridge. The Landmarks Commission responded on April 6, 2026, stating that they had no feedback on the proposed measures at the time. The proposed mitigation measures were then presented to the Landmarks Commission at the Commission's June 2, 2026 meeting. The Commission made suggestions to enhance the proposed mitigations, including incorporating the 1915 bridge plaque into the new bridge. These recommendations were incorporated into Mitigation Measure CUL-1, described in *Section 4.5, Cultural Resources*. Therefore, the Project is consistent with the requirements of the HD combining zoning district.

The SR district requires that development be subject to administrative design review to ensure that new structures are screened from public view by natural landforms, existing vegetation, or native, fire-resistant plantings. The Project would be subject to administrative design review prior to approval in compliance with the zoning ordinance. The new bridge would replace the existing bridge in kind, meaning that it will have the same functionality, be located in the same general location, and will be similar in size. Therefore, the Project would not conflict with requirements of the SR district.

The RC district aims to protect and preserve riparian areas, including streams, streambanks, and surrounding vegetation. As a transportation infrastructure project, the Project would not introduce any new land uses within 100 feet of Maacama Creek. The only new structures within 100 feet of the creek would be the proposed new bridge, retaining walls, and new roadway alignment. These new structures would replace the existing historic bridge and approach roadways and would not introduce any new land uses which would have a substantial impact on biological or hydrological resources within the RC district. All vegetation removed as part of the Project would be replaced with native plants and trees, which would result in a long-term beneficial impact to riparian habitat. Therefore, the Project would not conflict with requirements of the RC district.

The OAK and VOH combining districts are meant to protect and enhance native oak woodlands and valley oak habitats. Mitigation is required for the removal of trees within these districts, which may include retention of other oaks, replacement plantings, or an in-lieu fee. These portions of the zoning code are not applicable to Sonoma County Public Infrastructure Projects; therefore, no significant impact related to conflicts with these zoning districts would occur. The

Project would require the removal of vegetation and trees; however, as required by Mitigation Measure BIO-7, all trees would be replanted following Project construction and disturbed areas would be replanted with native vegetation.

A portion of APN 132-060-013 is within the Z district, which prohibits the development of an ADU. The Project would not include construction of an ADU; therefore, the Project would not conflict with this zoning district.

Therefore, the Project would not conflict with any applicable land use plan adopted for the purpose of avoiding or mitigating an environmental effect, including the Sonoma County General Plan and Zoning Ordinance. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

4.12 Mineral Resources

This section describes the existing setting of the Project site as it relates to mineral resources, identifies associated regulatory requirements, analyzes potential impacts related to the loss of known mineral resources, and identifies mitigation measures as necessary to reduce the impacts of the proposed Project on mineral resources.

4.12.1 Setting

Mineral resources are important due to their limited availability and essential role in modern construction and industrial applications. Sonoma County is rich in such resources, with historical extraction of such minerals as mercury, chromite, and copper. Today, materials such as sand, gravel, crushed rock, and building stone are among the County's most valuable mineral commodities.

Extraction of bedrock for use as building blocks, road base, and fill has typically occurred in upland areas with steep terrain (County of Sonoma 2006). Additionally, sand and gravel have been mined from the Russian River and other major waterways to support concrete production and construction needs. Different geologic formations across the county yield distinct types of minerals due to variations in composition and formation processes. The County maintains maps identifying the location and extent of mineral resources deemed significant in recent studies. There are no mapped mineral resources or active mining operations located within the Project site.

4.12.2 Regulatory Setting

FEDERAL REGULATIONS

U.S. Department of the Interior's Minerals Availability System

This system designates 15 to 17 rare Earth minerals as essential for applications related to the U.S. Department of Defense or as vital to national security. It advocates for the creation of a comprehensive strategy to secure the supply of these resources, outlining associated risks and recommended timelines for necessary actions.

STATE REGULATIONS

Surface Mining and Reclamation Act

Gravel mining operations in Sonoma County and throughout California are regulated under the California Surface Mining and Reclamation Act (SMARA). The purpose of SMARA is to identify and protect areas with significant mineral resources. To accomplish this, the SMARA (a) regulates surface mining activities to prevent or minimize environmental impacts, (b) requires that mined lands be reclaimed to a usable condition suitable for alternative land uses, (c) supports the production and conservation of minerals while taking into account values such as recreation, watershed health, wildlife habitat, grazing, and aesthetic enjoyment, and (d) eliminates any remaining hazards that could affect public health and safety. Mining operations must comply with SMARA during all phases of a project, including reclamation. No state-mapped mineral resources are present on or in the vicinity of the Project site.

REGIONAL AND LOCAL REGULATIONS

Sonoma County Aggregate Resources Management Plan

The Sonoma County Aggregate Resources Management (ARM) Plan establishes guidelines and objectives for management of aggregate mining in the county (Sonoma County 2025b). The ARM Plan was adopted by the County in 1980 and updated in 1994, 2003, and 2010. The goal of the ARM Plan is to meet the County's needs for aggregate while minimizing environmental impacts and land use conflicts. The ARM Plan discusses incentives to stimulate quarry production, limitations on terrace mining, support for recycling of aggregate products, and reclamation of terrace mining areas for agricultural uses and habitat restoration. The ARM Plan also plans for continued in-stream extraction for flood and erosion control with protection for fisheries and other adjacent uses.

Specific objectives of the ARM Plan include the following:

> **Objective 1:** Assist existing quarry operations to increase production for high-quality uses in an environmentally sound manner.
>
> **Objective 2:** Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.
>
> **Objective 3**: Provide for terrace resources to meet the needs for high quality uses for a ten-year period and terminate terrace mining at the end of that period.
>
> **Objective 4**: Manage instream resources on a sustained yield basis for high quality uses in a manner which reduces bank erosion, maintains flood flow capacities, protects adjacent uses, and minimizes impacts on fisheries, vegetation and wildlife.
>
> **Objective 5**: Continue and expand monitoring programs so that more information is available for future decisions about terrace and instream impacts and alternative management policies and approaches.
>
> **Objective 6**: Reevaluate gravel extraction methods and production periodically to assess options which would further reduce environmental impacts and land use conflicts or better meet the County's aggregate needs.
>
> **Objective 7**: Change specifications, standards and practices where possible so that quarry rock will be more competitive with instream and terrace sources.
>
> **Objective 8**: Reduce the need for additional aggregate through utilization of recycled and substitute materials, changes in development standards, and other means possible.
>
> **Objective 9**: Encourage the retention of locally produced aggregate for use within Sonoma County.

Sonoma County General Plan

The General Plan Open Space and Resource Conservation Element contains the following relevant policies for the protection of mineral resources:

> **Policy OSRC-13a:** Consider lands designated in the ARM Plan as priority sites for aggregate production and mineral extraction and review requests for additional designations for conformity with the General Plan and the ARM Plan.

Policy OSRC-13b: Review projects for environmental impact and land use conflicts and consider the following minimum factors when approving mining permits: topsoil salvage, vegetation, fisheries and wildlife impacts, noise, erosion control, roadway conditions and capacities, reclamation and bonding, air quality, energy consumption, engineering and geological surveys, aggregate supply and replenishment, drainage, and the need for economical aggregate materials.

Policy OSRC-13c: Review projects that are on or near sites designated "Mineral Resources" in the ARM Plan for compatibility with future mineral extraction.

Sonoma County Zoning Code

The Sonoma County Zoning Code establishes the Mineral Resources (MR) Combining District, which regulates mining and reclamation of mined lands in the county, consistent with the ARM Plan. Combined with several base zones, various uses are permitted as a right or subject to a use permit. Incompatible uses and residential uses are restricted. Provisions of this article require County approval of surface mining use permit and approval of a reclamation plan.

4.12.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or,*

b) *Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.*

METHODOLOGY

Impacts related to mineral resources were evaluated using information found in the ARM Plan and on the County's website.

PROJECT IMPACTS AND MITIGATION MEASURES

a, b) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

The Project site does not contain mapped mineral resources, and the Project would not involve mining or require the acquisition of land where active mining operations are occurring (Sonoma County 2025b). No portion of the Project site is within the MR combining district (Sonoma County 2025a). The Project would not result in the loss of availability of a known mineral resource or a mineral recovery site. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

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4.13 Noise

This section describes the existing noise setting of the Project site, identifies associated regulatory requirements, evaluates potential Project-level and cumulative impacts, and identifies mitigation measures related to implementation of the proposed Project. The construction noise analysis is based on data within a technical memorandum prepared by Illingworth & Rodkin, Inc. for the County in May 2022.

4.13.1 Fundamentals of Noise

SOUNDS, NOISE, AND ACOUSTICS

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting noise propagation to the receptor determines sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound. Basic acoustical terms are defined in Table 4.13-1.

FREQUENCY

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 and 20,000 Hz.

SOUND PRESSURE LEVELS AND DECIBELS

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa.

Table 4.13-1. Definition of Acoustical Terms

TERM	DEFINITION
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 mPa.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in mPa. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a

TERM	DEFINITION
	reference sound pressure (e. g., 20 mPa). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}. L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1, 10, 50, and 90 percent of the time during the measurement period.
Day/Night Noise Level, (L_{dn} or DNL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Harris 1998

ADDITION OF DECIBELS

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB - rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

A-WEIGHTED DECIBELS

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make a judgment of the relative loudness or annoyance of a sound, their judgment correlates well with the A-scale sound levels of those sounds. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA.

HUMAN RESPONSE TO CHANGES IN NOISE LEVELS

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

NOISE DESCRIPTORS

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a one-hour period and is the basis for NAC used by Caltrans and Federal Highway Administration (FHWA).
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10 percent of the time, and L_{90} is the sound level exceeded 90 percent of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.

- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on factors such as geometric spreading, ground absorption, atmospheric effects, and shielding by natural or human-made features.

CONSTRUCTION NOISE

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Construction noise levels vary on a day-to-day basis, depending on the type and amount of equipment operating on-site and the specific task that is being completed on a particular day. Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The highest maximum noise levels generated by project construction would typically range from about 80 to 90 dBA L_{max} at a distance of 50 feet from the noise source. Extreme noise generating construction methods such as pile driving are not expected for the proposed project.

Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA noise reduction at distant receptors.

VIBRATION

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction-generated vibration for building damage and human complaints.

Construction activities can cause vibrations that vary in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

4.13.2 Environmental Setting

EXISTING NOISE ENVIRONMENT

The noise environment at the Project site and at receptors in the Project vicinity results primarily from traffic along Chalk Hill Road. The traffic volume along Chalk Hill Road is relatively low and inconsistent. Seasonally, existing agricultural activities in the area may increase the noise levels, but during the most conservative conditions, most of the background noise consists of distant traffic, birds, insects, and wind.

Ambient noise measurements made by Illingworth & Rodkin, Inc. in March 2015 were used to establish existing noise levels in the surrounding area. Figure 4.13-1 shows the measurement locations made in 2015 with respect to the project site boundaries. The 2015 monitoring survey included two long-term measurements (LT-1 and LT-2) along Chalk Hill Road at Thomas Road. The survey began on Friday, March 6, 2015, and concluded on Tuesday, March 10, 2015. These measurements represent the ambient noise levels at existing residential land uses located along Chalk Hill Road (LT-1) and set back from Chalk Hill Road (LT-2).

Site LT-1 is located approximately 50 feet from the centerline of Chalk Hill Road. Existing ambient day-night average noise levels at LT-1 ranged from 53 to 57 dBA L_{dn}. Site LT-2 is located approximately 315 feet east of Chalk Hill Road along Thomas Road. Existing ambient day-night average noise levels at LT-2 ranged from 46 to 48 dBA L_{dn}. Table 4.13-2 summarizes the highest L_{max} and highest hourly L_{eq} values measured at each LT location for the daytime and nighttime hours. The average L_{max} and L_{eq} values are also shown.

Table 4.13-2. Summary of LT Noise Measurements

NOISE MEASUREMENT LOCATION (DATE, TIME)	PERTINENT ACTIVITIES	DAYTIME HOURS, 7 AM-10 PM		NIGHTTIME HOURS, 10 PM-7 AM	
		L_{MAX}	L_{EQ}	L_{MAX}	L_{EQ}
LT-1: At the northeast corner of Chalk Hill Road/Thomas Road intersection, 50 feet from the centerline of Chalk Hill Road (March 6, 2015, 5:00 pm to March 10, 2015, 8:00 am)	Local traffic and other ambient noise sources	Max = 82 dBA Average = 74 dBA	Max = 60 dBA Average = 53 dBA	Max = 82 dBA Average = 67 dBA	Max = 57 dBA Average = 45 dBA
LT-2: At the northeast corner of the Chalk Hill Road/Thomas Road intersection, 315 feet from the centerline of Chalk Hill Road (March 6, 2015, 5:00 pm to March 9, 2015, 1:00 pm)	Local traffic and other ambient noise sources	Max = 66 dBA Average = 59 dBA	Max = 53 dBA Average = 43 dBA	Max = 64 dBA Average = 51 dBA	Max = 45 dBA Average = 40 dBA

SENSITIVE RECEPTORS

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. The County's Guidelines for the Preparation of Noise Analysis lists noise-sensitive uses as residences (including single-family homes, multi-family apartments, condominiums, and mobile homes, and other permitted structures in residential use), schools (both public and private), day care facilities, hospitals, nursing homes, long term medical or mental care facilities, places of worship, libraries and museums, transient lodging, and office building interiors.

Vibration sensitive receivers are similar to noise sensitive receivers, such as residences and institutional uses (e.g., schools, libraries, and religious facilities).

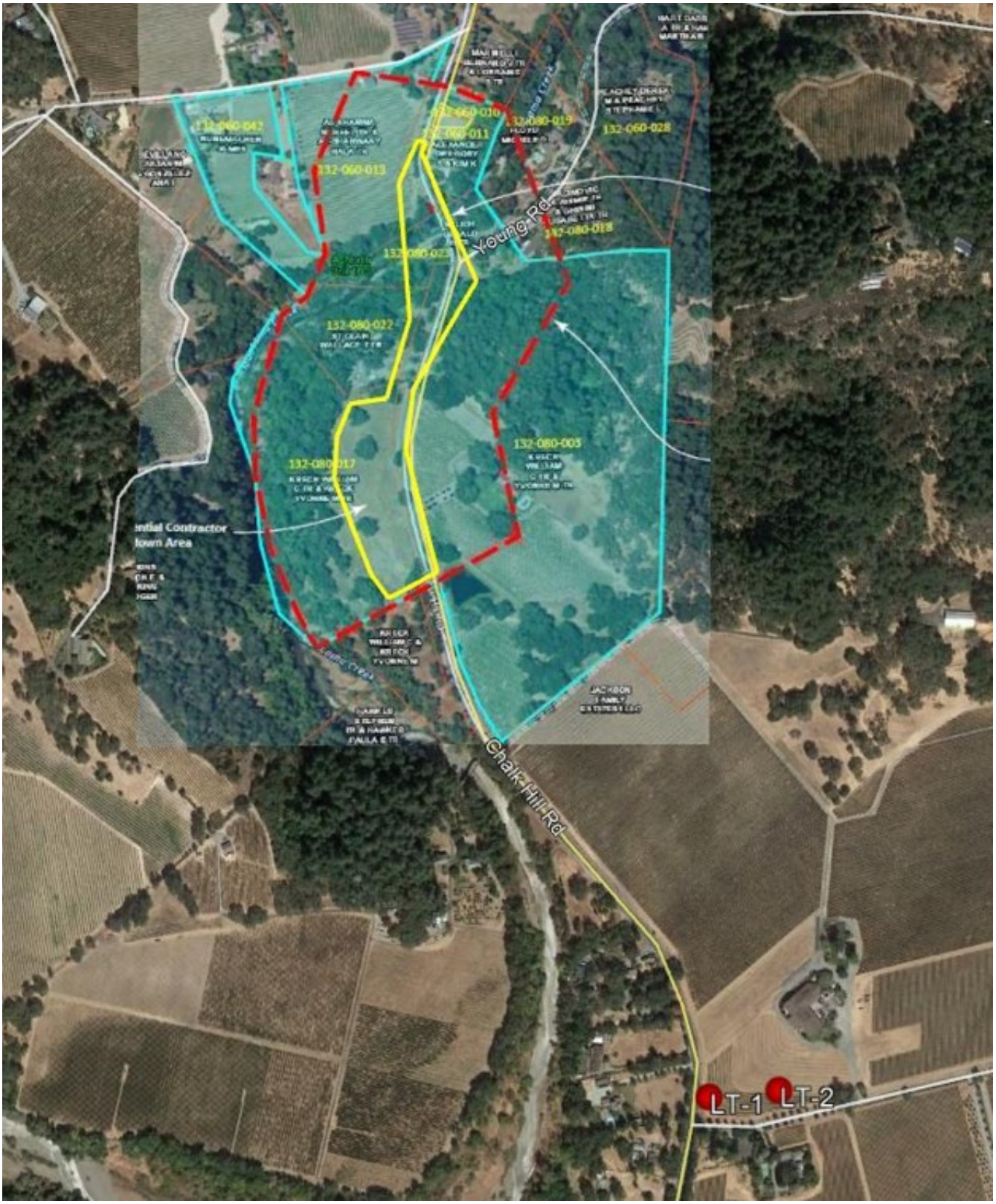


Figure 4.13-1. Project Vicinity and Noise Measurement Locations

Chalk Hill Road Bridge Replacement
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4.13.3 Regulatory Setting

STATE REGULATIONS

Caltrans Transportation and Construction Vibration Guidance Manual

The Transportation and Construction Vibration Guidance Manual provides guidance on vibration issues associated with the construction, operation, and maintenance of Caltrans projects (Caltrans 2020). Noise associated with construction is controlled by Caltrans Standard Specification Section 14-8.02, "Noise Control," which states the following:

- Do not exceed 86 dBA Lmax at 50 feet from the job site activities from 9:00 p.m. to 6:00 a.m.
- Equip an internal combustion engine with the manufacturer recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

Typically, work taking place within the Caltrans right-of-way is not subject to local noise ordinances; however, Caltrans will work with the contractor to meet local requirements where feasible. If construction noise level is expected to exceed the contract specification criteria or construction noise levels are expected to exceed the ambient (baseline) noise levels, and there are sensitive receptors near the project site construction noise control measures should be considered.

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The primary goal of the General Plan Noise Element is to "Protect people from the adverse effects of exposure to excessive noise and to achieve an environment in which people and land uses function without impairment from noise." The General Plan Noise Element contains the following relevant policies related to noise:

- **Policy NE-1a:** Designate areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dB Ldn, 60 dB CNEL, or the performance standards of Table NE-2 (presented in Table 4.13-3 below) for non-transportation noise sources (not applicable to the project site).
- **Policy NE-1c:** Control non-transportation related noise from new projects. The total noise level resulting from new sources shall not exceed the standards in Table NE-2 as measured at the exterior property line of any adjacent noise sensitive land use. Limit exceptions to the following:
    - If the ambient noise level exceeds the standard in Table NE-2, adjust the standard to equal the ambient level, up to a maximum of 5 dBA above the standard, provided that no measurable increase (i.e. +/- 1.5 dBA) shall be allowed
    - Reduce the applicable standards in Table NE-2 by five dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels
    - Reduce the applicable standards in Table NE-2 by 5 decibels if the proposed use exceeds the ambient level by 10 or more decibels.
    - For short term noise sources which are permitted to operate no more than six days per year, such as concerts or race events, the allowable noise exposures shown in Table NE-2 may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise

monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area.

- Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of the exterior property line of the adjacent noise sensitive land use where:
  - the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and
  - there is available open land on those noise sensitive lands for noise attenuation.

  This exception may not be used on vacant properties which are zoned to allow noise sensitive uses.*

- **Policy NE-1d:** Consider requiring an acoustical analysis prior to approval of any discretionary project involving a potentially significant new noise source or a noise sensitive land use in a noise impacted area.
- **Policy NE-1i:** County equipment and vehicles shall comply with adopted noise level performance standards consistent with the best available control technology.

Table 4.13-3. Maximum Allowable Exterior Noise Exposures for Non-transportation Noise Sources

HOURLY NOISE METRIC[1], DBA	DAYTIME (7 A.M. TO 10 P.M.)	NIGHTTIME (10 P.M. TO 7 A.M.)
L_{50} (30 minutes in any hour)	50	45
L_{25} (15 minutes in any hour)	55	50
L_{08} (4 minutes 48 seconds in any hour)	60	55
L_{02} (72 seconds in an7 hour)	65	60

[1]*The sound level exceeded n% of the time in an hour, e.g., the L_{50} is the value exceeded 50% of the time or 30 minutes in any hour.*

Source: Sonoma County General Plan 2020 Noise Element.

Sonoma County Guidelines for Preparation of Noise Analysis

The County's Guidelines for the Preparation of Noise Analysis outlines the methods and recommendations for use when preparing an acoustical analysis in Sonoma County (County of Sonoma 2019). The guidelines build on the Sonoma County General Plan 2020 Noise Element and outline the noise analysis process, criteria for requiring a noise analysis, noise analysis protocol, and noise management methodology for individual projects.

The County guidelines address temporary construction noise, which is not specifically included in the General Plan 2020 Noise Element. The guidelines state that temporary construction noise generally needs to be evaluated at a qualitative level, given its temporary and short-term nature, however, construction noise may be considered significant if it occurs in the early morning or evening hours and requires a quantitative analysis. If construction activities occur during the hours of 10 p.m. to 7 a.m., then the noise standards in Table 4.13-3 would apply.

4.13.4 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;*

b) *Generation of excessive groundborne vibration or groundborne noise levels; or,*

c) *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.*

APPROACH TO IMPACT ANALYSIS

Construction noise would primarily result from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks. FHWA's Roadway Construction Noise Model (RCNM) was used to calculate the maximum and hourly average noise levels anticipated for the worst-case scenario. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment. The usage factors represent the percentage of time that the equipment would be operating at full power.

For each construction phase, a list of construction equipment expected to be used at various times throughout the phase was provided, along with the estimated hourly average noise level and maximum noise level for each phase, which is summarized in Appendix E. While it is unlikely that every piece of equipment would be operating simultaneously, multiple pieces would be expected to be used at any given time. To estimate the worst-case scenario, the five loudest pieces of equipment per phase were assumed to be operating simultaneously, generating a combined loudest hourly average noise level at a distance of 50 feet.

Table 4.13-4 provides the expected noise levels generated by project construction activities at a distance of 50 feet. The maximum instantaneous noise level shown for each phase represents the maximum noise level for the loudest piece of equipment at 50 feet.

Table 4.13-4. Summary of Construction Noise Modeling Source Levels at a Distance of 50 Feet

ACTIVITY	L_{MAX}[A] (DBA)	L_{EQ}[B] (DBA)
CONSTRUCTION SEASON 1		
Bridge Abutments	84	84
Access to Creek Bed	84	82
Stream Diversion and Creek Bed Protection	84	83
Superstructure falsework	81	82
Concrete Bridge Construction	83	84
Remove Stream Diversion	81	80
Retaining Walls, Approach Roadways, and Tie-Ins	90	87
CONSTRUCTION SEASON 2		
Restore Access to Creek Bed	82	82
Restore Stream Diversion and Creek Bed Protection	84	83
Existing Bridge Demolition	90	86
Remove Stream Diversion	81	80

Remove and Revegetate Old Approach Roadways	84	84
Project Move Out	82	79

[a] L_{max} noise levels are the maximum instantaneous noise level for the loudest individual piece of equipment.
[b] L_{eq} noise levels are the hourly average noise level for the five loudest pieces of equipment combined.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

The Sonoma County General Plan does not establish a noise threshold for construction activities. Therefore, the FTA's daytime threshold of 90 dBA L_{eq} would be applied to all residential land uses within 500 feet of the bridge construction area. As shown above in Table 4.13-4, the L_{max} and L_{eq} for the worst-case scenario construction noise levels expected for the proposed Project during each phase of construction would range from 81 to 90 dBA L_{max} and from 79 to 87 dBA L_{eq}, as measured at a distance of 50 feet from the center of the Project site.

The modeled noise levels summarized in Table 4.13-4 could be centered at any location throughout the Project site. Construction work for the proposed Project would mostly occur at the bridge. To estimate the worst-case construction noise, the levels in Table 4.13-4 were positioned at the center of bridge and propagated to the nearest noise-sensitive receptors located within 500 feet of the bridge. These receptors are highlighted blue in Figure 4.13-2, with the green line representing the 500-foot boundary. For estimating worst-case construction noise, the L_{max} and L_{eq} levels in Table 4.13-4 were propagated to the center of the outdoor use area of individual residences using the 6 dB per doubling of the distance fall-off rate. The estimated noise levels at each receptor during Project construction are summarized for each phase in Table 4.13-5. These noise levels are estimated for the worst-case scenario at the center of the outdoor use areas for all sensitive receptors located within 500 feet of the Project site.



Figure 4.13-2. Receptors Located within 500 feet of the Improvements to the Roadway Alignment

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Chalk Hill Road Bridge Replacement
Sonoma County, California

Table 4.13-5. Summary of Construction Noise Levels Estimated at Receptors Located within 500 feet of the Construction Alignment

	RECEPTOR (PROPAGATION DISTANCE, FEET)	AVERAGE DAYTIME AMBIENT NOISE LEVELS (DBA)		ESTIMATED CONSTRUCTION NOISE LEVELS (DBA)	
		L_{max}	L_{eq}	L_{max}	L_{eq}
Season 1	R1 (150 feet)	74	53	71 to 80	71 to 78
	R2 (200 feet)	74	53	69 to 78	68 to 75
	R3 (325 feet)	59	43	64 to 73	64 to 71
	R4 (420 feet)	59	43	62 to 71	62 to 69
	R5 (580 feet)	59	43	59 to 68	59 to 66
	R6 (465 feet)	74	53	61 to 70	61 to 68
	R7 (590 feet)	74	53	59 to 68	59 to 66
	R8 (480 feet)	74	53	61 to 70	60 to 68
	R9 (560 feet)	59	43	60 to 69	59 to 66
	R10 (540 feet)	59	43	60 to 69	59 to 67
	R11 (495 feet)	59	43	61 to 70	60 to 67
	R12 (1,000 feet)	59	43	55 to 64	54 to 61
	R13 (830 feet)	59	43	56 to 65	56 to 63
Season 2	R1 (150 feet)	74	53	72 to 81	70 to 76
	R2 (200 feet)	74	53	69 to 78	67 to 74
	R3 (325 feet)	59	43	65 to 74	63 to 70
	R4 (420 feet)	59	43	63 to 72	61 to 67
	R5 (580 feet)	59	43	60 to 69	58 to 65
	R6 (465 feet)	74	53	62 to 71	60 to 66
	R7 (590 feet)	74	53	60 to 69	58 to 65
	R8 (480 feet)	74	53	62 to 71	60 to 66
	R9 (560 feet)	59	43	60 to 69	58 to 65
	R10 (540 feet)	59	43	61 to 70	59 to 65
	R11 (495 feet)	59	43	62 to 70	59 to 66
	R12 (1,000 feet)	59	43	55 to 64	53 to 60
	R13 (830 feet)	59	43	57 to 66	55 to 61

Based on the results in Table 4.13-5, the nearest noise-sensitive receptors would not be exposed to temporary construction noise in excess of the FTA's 90 dBA L_{eq} exterior noise threshold; however, existing ambient noise conditions would be exceeded by more than 5 dBA L_{eq} at times throughout construction.

Construction activities would be conducted between 7:00 a.m. and 7:00 p.m. on weekdays and between 9:00 a.m. and 7:00 p.m. on weekends and holidays. While Sonoma County does not have a quantitative noise threshold for construction activities, the County has developed a *Guidelines for the Preparation of Noise Analysis* (Guidelines) document, which requires implementation of measures to reduce construction noise levels if a project takes longer than one year to complete; if a project requires pile driving; or if a project located within 600 feet for noise-sensitive uses would involve nighttime work (between 10:00 p.m. and 7:00 a.m.) (County of Sonoma 2019). The Guidelines further state that while little can be done to reduce noise levels generated by construction equipment, measures should be considered in cases where sensitive receptors may be impacted. Since the proposed Project would take longer than one year to complete, the Project shall incorporate Mitigation Measure NOISE-1 to reduce noise levels as much as possible to comply with the County's Guidelines.

In addition, due to the length of the proposed construction Project, the close proximity to residential land uses, and the noise-generating equipment proposed for use at the site, Mitigation Measure NOISE-2 shall be implemented to adhere to the County's construction BMPs to further reduce construction noise levels emanating from the site and minimize disruption and annoyance at existing noise-sensitive receptors in the Project vicinity. With implementation of Mitigation Measures NOISE-1 and NOISE-2, the Project would not generate a substantial temporary increase in ambient noise levels due to construction activities. The impact would be ***less than significant with mitigation incorporated***.

Operation

Once the new bridge is in service and the existing bridge is demolished, noise conditions at the Project site would be similar to pre-Project conditions. The new bridge would have a "quiet deck" constructed with longitudinal texturing, which produces less tire and pavement interface noise than the transverse texturing method previously used on most bridge decks in the State. Therefore, noise conditions at the site during Project operation are anticipated to be less than pre-project noise levels, which is a beneficial operational impact. Therefore, operation of the Project would not generate a substantial permanent increase in ambient noise levels at the Project site. ***No impact*** would occur.

Mitigation Measures

Mitigation Measure NOISE-1: General Construction Activities Noise Reduction Measures

The following measures shall be implemented throughout Project construction, in accordance with the County's' *Guidelines for the Preparation of Noise Analysis* document:

- Limiting hours of construction to avoid the early morning and evening hours (such as 7:00 a.m. to 7:00 p.m. weekdays and 7:00 a.m. to 5:00 p.m. weekends). While the proposed Project construction hours would lie outside these recommended hours, approval from the County should be obtained prior to work commencing.
- Limiting work to non-motorized equipment on Sundays and holidays.
- Using sound blankets for loud operations, such as pile driving, air compressors or other mechanical equipment, and consider pre-drilling holes prior to pile driving.

- Siting construction staging areas as far as practical from nearby sensitive receptors.
- Require street legal mufflers on all construction equipment.

Mitigation Measure NOISE-2: Construction Noise Control Plan

Prior to the beginning of Project construction, a construction noise control plan shall be developed by the Project construction contractor and submitted to the County for review and approval. The plan shall include, but is not limited to, the following construction best management controls:

- Construct solid plywood fences along the construction site boundaries. Residences R1 and R2 are located in close proximity to Project boundary and constructing a temporary noise barrier fence to shield these receptors would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receptor and if the barrier is constructed in a manner that eliminates any cracks or gaps. For this Project, a minimum height of 8 feet for the temporary barrier should be used.
- Except as provided herein, impact tools (e.g., jackhammers, pavement breakers, and rock drills) used for Project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.
- Stage large equipment, compressors, or generators at least 25 feet from the site perimeters located near residences R1 and R2 when work is not being done near these residences.
- Construction activities should be conducted in a manner that minimizes the noise impact at the adjacent property boundaries wherever possible. Construction equipment shall be positioned as far from noise-sensitive receptors as possible.
- Unnecessary idling of internal combustion engines should be strictly prohibited.
- Prohibit noise from construction workers' stereos or other music devices.
- Designate an on-site "disturbance coordinator," who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will maintain a complaint log, which shall include complaints received, the cause of the noise complaints (e.g., bad muffler, etc.), and how the noise complaint was addressed. Conspicuously post a large sign with information regarding the construction days/hours, complaint procedures, and telephone number for the disturbance coordinator and County Code Enforcement unit at the construction site.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction of the Project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include demolition/excavation, underground utilities, concrete/asphalt placement, portable building, and

delineation and landscaping. The proposed Project is not expected to require pile driving, which can cause excessive vibration. Instead, a cast-in-drilled-hole method would be utilized to install the piles. Critical factors pertaining to the impact of construction vibration on sensitive receptors include the proximity of the existing structures to the Project site, the soundness of the structures, and the methods of construction used.

The County has not established thresholds of significance for vibration generated from construction projects. Therefore, the Caltrans vibration threshold will be used to assess potential impacts. For structural damage, Caltrans recommends a vibration limit of 0.5 in/sec PPV for new residential structures and modern industrial/commercial buildings, 0.3 in/sec PPV for older residential structures, and a conservative limit of 0.08 in/sec PPV for extremely fragile historic buildings, ruins, and ancient monuments. No known historical buildings adjoin the Project area. Therefore, conservatively, groundborne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact to older buildings in the area.

Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Vibration levels perceived at receptors would vary depending on soil conditions, construction methods, and equipment used. Based on the results of the vibration assessment, typical vibration levels that could be expected from construction equipment at a distance of 25 feet would range from 0.003 and 0.210 in/sec PPV. The nearest residences (R1 and R2) to the bridge work are approximately 30 to 80 feet from where the potential construction equipment could be used along the roadway alignment. At 30 feet, vibration levels would range from 0.002 to 0.172 in/sec PPV, which would be below the 0.3 in/sec PPV threshold. These levels would range from barely perceptible to strongly perceptible; however, damage to the structures would not be expected.

All other residential dwellings would be 195 feet or more from the Project alignment. At 195 feet, vibration levels would be up to 0.022 in/sec PPV. Vibration levels would be barely perceptible and would not result in damage to any structures.

Construction vibration would at times potentially range from being barely to strongly perceptible to the occupants of the residences located within 200 feet of the Project alignment. However, the construction-generated vibration levels for the proposed Project would not result in cosmetic damage (e.g., hairline cracks in plaster, opening of old cracks, etc.) at these dwellings. Therefore, the impact of construction activities would be less than significant, and no mitigation measures are required.

Operation

Once the new bridge is in service and the existing bridge is demolished, noise conditions at the Project site would be similar to pre-project conditions. As described above under Impact a), the new bridge would have a "quiet deck," which is meant to reduce noise levels of vehicles crossing over the bridge. Therefore, vibration conditions at the site during Project operation are anticipated to be less than pre-Project noise levels, which is a beneficial operational impact.

Mitigation Measures

No mitigation measures are required.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or

public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The Project site is not located within the vicinity of a private airstrip or an airport land use plan, or within two miles of a public airport or public use airport. The nearest airport to the Project site is the Healdsburg Municipal Airport, located approximately 7.25 miles northwest of the Project site. Therefore, no people residing or working in the Project area would be exposed to excessive noise levels associated with aircrafts. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

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4.14 Population and Housing

This section describes the existing setting of the Project site related to population and housing, identifies associated regulatory requirements, analyzes potential impacts related to population growth and displacement of people or housing, and identifies mitigation measures as needed to reduce impacts of the proposed Project with respect to population and housing.

4.14.1 Setting

POPULATION

As shown in Table 4-14.1, unincorporated Sonoma County had an estimated population of 130,801 in 2025 (California Department of Finance [DOF] 2025a). Table 4-14.1 also shows population growth in the unincorporated county since census year 2010. There has been an overall decline in population since 2010, which is largely due to high housing costs, wildfire impacts, and an aging population (Sonoma County Economic Development Board 2024).

Table 4-14.1. Population in Unincorporated Sonoma County (2010 & 2020-2025)

YEAR	POPULATION	PERCENT CHANGE FROM PREVIOUS YEAR
2010	145,363	-
2020	134,496	-
2021	131,347	-2.34
2022	131,635	+0.22
2023	131,267	-0.28
2024	131,332	+0.05
2025	130,801	-0.40

Source: California DOF 2023, California DOF 2025a

HOUSING

A household is defined as a group of people who occupy a housing unit (United States Census Bureau 2020). A household differs from a dwelling unit because total dwelling units includes both occupied and vacant dwelling units. Not all the population lives in households; a portion lives in group quarters, such as board and care facilities and others are unhoused.

Household Size

Smaller households, typically consisting of one to two people, generally live in units with zero to two bedrooms. Family households with three to four members usually reside in units with three to four bedrooms. Larger households, with five or more people, tend to occupy units with four or more bedrooms. The match between unit size and household size often reflects both personal preference and economic factors. Some small households choose larger units, while some large households live in smaller ones, often due to financial considerations.

Table 4.14-2 compares the average person per household in unincorporated Sonoma County with incorporated Sonoma County in 2010, 2020, and 2025. The average household size in unincorporated and incorporated Sonoma County slightly increased between 2010 and 2020 but

then decreased between 2020 and 2025. Overall, the unincorporated County has maintained a lower average household size than incorporated Sonoma County over the last 15 years.

Table 4.14-2. Average Persons per Household Compared in Unincorporated and Incorporated Sonoma County in 2010, 2020, and 2025

LOCATION	2010	2020	2025
Unincorporated Sonoma County	2.46	2.48	2.36
Incorporated Sonoma County	2.59	2.58	2.46

Source: California DOF 2023, California DOF 2025b

Housing Units

Table 4.14-3 shows the growth in number of housing units in unincorporated Sonoma County since 2010. Between 2010 and 2020, approximately 6,006 housing units were removed from the housing inventory in unincorporated County areas, an average yearly decrease of approximately 600 units. This trend is similar to the population trend in Table 4-14.1, where the population decreased between 2010 and 2020. Between 2020 and 2025, approximately 1,758 housing units were added from the housing inventory in unincorporated County areas, an average yearly increase in the housing stock of approximately 352 units. Although there has been an overall decline in population between 2020 and 2025, the reason for the increase in housing between 2020 and 2025 is due to the rebuilding of homes that were lost in the 2017 Sonoma Complex Fires, which destroyed over 2,200 housing units in the unincorporated County (County of Sonoma 2020), the 2019 Kincade Fire, which destroyed 374 structures, (CAL FIRE 2019), the 2020 Glass Fire, which destroyed 1,528 structures and damaged an additional 282 structures across both Napa and Sonoma counties (CAL FIRE 2020), and the 2020 LNU Lightning Complex Fires, which destroyed 159 residences and damaged an additional 10 residences in Sonoma County (Graff 2020). Of the 63,719 housing units in the unincorporated County in 2025, 9,958 units (15.6 percent) were vacant (California DOF 2025b).

Table 4.14-3. Housing Units in Unincorporated Sonoma County Defined by Units Per Structure in 2010, 2020, and 2025

YEAR	SINGLE FAMILY (ATTACHED PLUS DETACHED)	MULTIFAMILY (2-4 UNITS)	MULTIFAMILY (5+ UNITS)	MOBILE HOMES	TOTAL UNITS	OCCUPIED UNITS
2010	58,293	2,607	2,425	4,642	67,967	56,951
2020	53,158	2,451	2,318	4,034	61,961	52,333
2025	54,387	2,513	2,699	4,120	63,719	53,761

Source: California DOF 2023, California DOF 2025b

PROJECTIONS

Table 4.14-4 shows 2050 projections of household population in the North Sonoma County superdistrict (Windsor, Healdsburg, and Cloverdale), which is the closest superdistrict to the Project site. It should be noted that these projections in household population are largely concentrated within this superdistrict's cities rather than in the unincorporated regions of this area. The household population of the North Sonoma County superdistrict is expected to increase by 3,000 in 2050 from 2015. This is an average increase of approximately 86 people per year

(roughly three percent). It is unlikely that the household population in the unincorporated area of this superdistrict will change significantly over this duration.

Table 4.14-4. 2050 Projections in Household Population in North Sonoma County

NORTH SONOMA COUNTY	2015	2050	CHANGE BETWEEN 2025 AND 2050
Household Population (number of residents)	36,000	39,000	3,000
Source: ABAG 2021, MTC 2021			

4.14.2 Regulatory Setting

STATE REGULATIONS

State Housing Element Law

California's housing element statutes (Government Code Sections 65580–65589.11) require local governments to plan for the housing needs of all economic segments within their communities, both now and in the future. The law acknowledges that in order for the private housing market to meet these needs effectively, local jurisdictions must adopt land use policies and regulatory frameworks that support, rather than inhibit, housing development. Consequently, state housing policy heavily relies on the implementation of local general plans, with a particular emphasis on the housing element.

Under Government Code Section 65588, housing elements must be reviewed and updated at least once every eight years. The County of Sonoma maintains a Housing Element as part of its General Plan. This element addresses housing affordability and outlines strategies for meeting the County's Regional Housing Needs Assessment (RHNA) targets.

REGIONAL AND LOCAL REGULATIONS

Regional Housing Needs Assessment

Under California's Housing Element law, every city and county must create local housing plans to accommodate their "fair share" of projected housing needs across all income levels, as determined by the State's Department of Housing and Community Development (HCD). Regional councils of governments, such as the ABAG, are responsible for distributing this statewide housing need among local jurisdictions by income group—a process known as the Regional Housing Needs Allocation (RHNA).

Through RHNA, each community receives a minimum number of housing units it must plan for, which involves two key strategies: 1) identifying "adequate sites" with appropriate zoning and density to support affordability, and 2) implementing housing programs that promote the development of below-market-rate units.

Table 4.14-5 presents the RHNA allocations for unincorporated areas of Sonoma County for the 2023-2031 cycle, broken down by income category.

Table 4.14-5. Unincorporated Sonoma County Regional Housing Needs Assessment

INCOME GROUP	2023-2031 RHNA ALLOCATION (UNITS)	PERCENT OF TOTAL
Very Low: up to 50 percent of area median income	1,024	26.8
Low: between 51 and 80 percent of area median income	584	15.3
Moderate: between 81 and 120 percent of area median income	627	16.4
Above Moderate	1,589	41.6
TOTAL:	**3,824**	**100**

Source: ABAG 2021

Sonoma County Transportation Authority

The Sonoma County Transportation Authority (SCTA) functions as the primary agency responsible for coordinating and advocating for transportation funding across Sonoma County. As the countywide entity for transportation planning and programming, SCTA plays a central role in securing funding, overseeing projects, and guiding long-range transportation planning efforts.

To meet the Metropolitan Transportation Commission's (MTC) requirement for local agencies to develop transportation plans aligned with the Regional Transportation Plan, SCTA developed *Moving Forward 2040 – The Comprehensive Transportation Plan* in September 2016. This plan incorporates data from the Association of Bay Area Governments (ABAG), MTC, the California Department of Finance (DOF), and the California Employment Development Department to project future trends in population, housing, and employment across both incorporated and unincorporated areas of Sonoma County through the year 2040.

According to *Moving Forward 2040*, Sonoma County's total population is projected to increase by approximately 23 percent between 2010 and 2040—a growth rate that aligns with ABAG's population forecasts.

Sonoma County General Plan

The Sonoma County General Plan Housing Element 2023-2031 update for was adopted by the County's Board of Supervisors on August 22, 2023. And certified by the California Department of Housing and Community Development on October 26, 2023. The Housing Element serves to assess current and future housing needs with the goal of preserving, enhancing, and expanding housing opportunities for all income levels within the community. It is composed of four main components: an introductory section; a framework outlining the County's housing goals, objectives, policies, and implementation programs; a comprehensive inventory of housing resources; and a Technical Background Report that supports the analysis.

The Housing Element contains the following relevant policies related to population and housing:

> **Policy HE-1c:** Ensure that design review, development standards, and conditions of approval for affordable housing projects do not result in a reduction of allowable project density, or in the number of affordable units, unless the project as proposed would result in one or more specific adverse impacts on public health or safety, and there is no other feasible method to mitigate the adverse impact(s).

Policy HE-3e: Continue to encourage affordable infill projects on underutilized sites within Urban Service Areas by allowing flexibility in development standards pursuant to state density bonus law (Government Code § 65915).

4.14.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or,*

b) *Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.*

APPROACH TO IMPACT ANALYSIS

For purposes of this analysis, "substantial" population growth is defined as growth exceeding ABAG or SCTA population forecasts for the unincorporated county or exceeding the County's identified population and housing needs. "Substantial" displacement would occur if allowed land uses would displace more residents than would be accommodated through growth provided by Project implementation.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Project would replace the existing bridge along Chalk Hill Road over Maacama Creek in eastern Sonoma County. The Project would not add additional vehicle lanes that would support or encourage population growth within the region, nor would it construct any new homes or businesses. Therefore, the Project does not include any growth-inducing activities. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The Project would require some right of way acquisition and temporary and permanent easements to facilitate project construction and operation. These acquisitions and easements, temporary or permanent, would not result in the displacement of existing housing or people. Therefore, construction of replacement housing elsewhere will not be required. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

4.15 Public Services

This section describes the existing setting of the Project site as it relates to public services, identifies associated regulatory requirements, analyzes potential impacts related to public services, and identifies mitigation measures as needed to reduce impacts of the proposed Project on public services.

4.15.1 Setting

FIRE PROTECTION

Fire protection, first response emergency medical services, and natural disaster preparedness services in unincorporated Sonoma County are provided by various fire departments. The project site is served by the Northern Sonoma County Fire Protection District (NSCFPD), which has a station located approximately 12 miles away, in Geyserville, California.

Fire protection districts are funded by County taxes and operated by the Fire Division of the Sonoma County Department of Emergency Services (Sonoma Local Agency Formation Commission 2013). Volunteer fire companies are funded primarily through donations, with equipment and administrative support provided by the County Department of Emergency Services (Wilmar Volunteer Fire Department 2020).

Response Times

The National Fire Protection Association Code Section 1720, Chapter 4, establishes response time goals for areas, based on the urbanization of the response location. For urban areas (more than 1,000 people per square mile), 80 percent of response times should be no longer than nine minutes; for suburban areas (500 to 1,000 people per square mile) the response time should be no more than 10 minutes, and for rural areas (less than 500 people per square mile) the response time should be no more than 14 minutes. For remote areas with a travel distance greater than 8 miles, the response time correlates directly to the travel distance. The NSCFPD's response zone is rural.

Wildland Fire Hazards

In California, responsibility for wildfire prevention and suppression is shared by federal, state, and local agencies. As discussed in *Section 4.20, Wildfire*, the project site is located in a moderate fire hazard severity zone within the Local Responsibility Area (LRA) but is surrounded by a very high fire hazard severity zone in the State Responsibility Areas (SRA). *Section 4.20, Wildfire*, also provides a description of nearby vegetation and wildfire risk associated with the Project site.

The State of California utilizes a Mutual Aid system to support any disaster that impacts a community, such a wildfire. Once a request is made, the California Emergency Management Agency contacts counties throughout California to assemble strike teams of fire engines and personnel to respond to the need. *Section 4.20, Wildfire*, addresses regulations and potential impacts related to wildfire, including smoke and subsequent flooding and runoff.

California Department of Forestry and Fire Protection

Preventing wildfires in the SRA is a vital part of the California Department of Forestry and Fire Protection (CAL FIRE) mission. CAL FIRE's Fire Prevention Program consists of multiple activities

including wildland pre-fire engineering, vegetation management, fire planning, education, and law enforcement. Typical fire prevention projects include brush clearance, prescribed burns, defensible space inspections, emergency evacuation planning, fire prevention education, fire hazard severity mapping, and fire-related law enforcement activities (CAL FIRE 2020). CAL FIRE also responds to medical aids, hazardous material spills, swift water rescues, search and rescue missions, civil disturbances, train wrecks, floods, earthquakes, and other emergency calls.

LAW ENFORCEMENT PROTECTION

Law enforcement protection services are provided by the Sonoma County Sherriff's Office. The Sheriff's Office is located at 2796 Ventura Avenue in Santa Rosa, with the nearest substations to the Project site in Windsor. The Windsor Police Department is located at 9291 Old Redwood Highway, Building 300 in Windsor, approximately 5.5 miles from the Project site.

The California Highway Patrol provides traffic safety and enforcement services on unincorporated roadways and State highways. The Highway Patrol has two offices serving Sonoma County – the nearest to the Project site is located along U.S. Highway 101 in Rohnert Park.

EMERGENCY MEDICAL SERVICES

Emergency medical services (EMS) in unincorporated Sonoma County are provided by a combination of public and private agencies, coordinated through the Coastal Valleys EMS Agency (CVEMSA). The Sonoma County Fire District (SCFD) serves as the primary provider of advanced life support (ALS) ground ambulance services in Exclusive Operating Area No. 1 (EOA-1), which encompasses central Sonoma County, including Santa Rosa, Rohnert Park, Sebastopol, Cotati, and surrounding communities. SCFD partners with Medic Ambulance Service, a CAAS-accredited private provider, to deliver these services (CVEMSA 2024, SCFD-EMS "About SCFD-EMSS").

In addition to SCFD, other EMS providers operate in unincorporated areas. Sonoma Life Support, operated by American Medical Response, provides ALS ambulance services in certain regions, including the western part of the county. For example, a partnership between Sonoma Life Support and the Gold Ridge Fire Protection District has stationed an ALS ambulance at Station 2 to serve the communities of Hessel, Twin Hills, and Freestone (Global Medical Response 2021).

First responder agencies, including fire departments and emergency medical technicians (EMTs), are responsible for initial emergency response. Most urban fire response units are staffed at the ALS level, while rural first responder services typically operate at the basic life support level. REDCOM Fire & EMS Dispatch Center manages emergency calls and dispatches services across the county, ensuring coordinated responses (CVEMSA 2024). The CVEMSA oversees the EMS system in Sonoma County, providing regulatory oversight, quality improvement, and coordination among providers to ensure effective and efficient emergency medical care.

SCHOOLS

The nearest school to the Project site is the Alexander Valley Elementary. Enrollment data and projected enrollment data, per the California Department of Finance, are shown in Table 4.15-1.

Table 4.15-1. Enrollment Data

SCHOOL	ENROLLMENT DATA (2024-2025)	PROJECTED ENROLLMENT (2034-2035)*
Alexander Valley Elementary	111	100

**Projected Enrollment is calculated based on an assumption of 10% decline in enrollment county-wide (DOF 2024).*
Sources: CDE 2025, DOF 2024.

PUBLIC LIBRARIES

Sonoma County operates a unified regional library system known as the Sonoma County Library, established under a Joint Powers Agreement in 1975. This agreement involves Sonoma County, its incorporated cities, and the Sonoma County Library itself. The system is overseen by the Library Commission, whose members are appointed by the Sonoma County Board of Supervisors and the cities of Santa Rosa and Petaluma. The library system includes 15 branches: Santa Rosa Central, Cloverdale Regional, Forestville (located at El Molino High School), Guerneville Regional, Healdsburg Regional, Occidental, Petaluma Regional, Rohnert Park-Cotati Regional, Roseland Community, Santa Rosa Northwest Regional, Sonoma County History and Genealogy, Rincon Valley Regional, Sebastopol Regional, Sonoma Valley Regional, and Windsor. The nearest library to the Project site is the Healdsburg Regional library, located approximately 11 miles to the west of the site.

PARKS AND RECREATIONAL FACILITIES

The nearest recreational facility to the Project site is Del Rio Woods, located approximately three miles west of the site. Del Rio Woods, located just east of Healdsburg, is owned and managed by Sonoma County Regional Parks. The park offers Russian river beach access and is a popular summer destination for paddling, picnicking, and sunbathing, and a year-round destination for fishing, birding, and wildlife viewing. Amenities include a picnic area with stairway access to the gravel beach, accessible parking, portable restrooms, and drinking fountains (Sonoma County Regional Parks “Del Rio Woods”).

4.15.2 Regulatory Setting

FEDERAL REGULATIONS

Disaster Mitigation Act

Section 104 of the Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) requires a state mitigation plan as a condition of disaster assistance. There are two different levels of state disaster plans: Standard and Enhanced. States that develop an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program. The Act has also established new requirements for local mitigation plans.

Sonoma County prepared a hazard mitigation plan in compliance with the DMA in 2006 and has updated the plan every five years since then, most recently in 2016. The County and its multijurisdictional partners are currently preparing an updated hazard mitigation plan. The Public Review Draft of the Sonoma County Multijurisdictional Hazard Mitigation Plan Update 2021 was published in July 2021.

The Sonoma County Multijurisdictional Hazard Mitigation Plan Update 2021 defines measures to reduce risks from natural disasters in the Sonoma County. Operational Area, which consists of the entire county, including unincorporated areas, incorporated cities, and special purpose districts. The plan complies with federal and state hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs for all planning partners. It updates the County's previous plan, the 2016 Sonoma County Operational Area Hazard Mitigation Plan.

National Fire Plan

The National Fire Plan, established in August 2000 under Executive Order 11246 in response to a significant wildland fire season, aims to enhance the nation's ability to manage and respond to severe wildfires and their effects on communities. It focuses on strengthening firefighting capabilities, supporting post-fire recovery, reducing hazardous fuels, assisting communities, and ensuring accountability in wildfire management efforts.

STATE REGULATIONS

California Fire Plan

The Strategic California Fire Plan is the State's roadmap for reducing the risk of wildfire. The plan was updated in 2012 and directs each CAL FIRE unit to prepare a locally specific Fire Management Plan for its area of responsibility. These documents assess the fire situation in each of CAL FIRE's 21 units and six contract counties. The plans include stakeholder contributions and priorities and identify strategic areas for pre-fire planning and fuel treatment, as defined by the people who live and work with the local fire problem. The plans are required to be updated annually.

California State Hazard Mitigation Plan

The purpose of the State of California Multi-Hazard Mitigation Plan (SHMP) is to significantly reduce deaths, injuries, and other losses attributed to natural and human-caused hazards in California. The SHMP provides guidance for hazard mitigation activities emphasizing partnerships among local, state, and federal agencies as well as the private sector. The California Office of Emergency Services prepares the SHMP, and in it identifies risks and includes a vulnerability analysis and a hazard mitigation strategy. The SHMP is federally required under the Disaster Mitigation Act of 2000 for the state to receive federal funding.

The 2018 California SHMP represents the state's primary hazard mitigation document and provides an updated analysis of the state's historical and current hazards, hazard mitigation goals and objectives and hazard mitigation strategies and actions. FEMA approved California's 2018 SHM on September 28, 2018.

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The following policies from the Public Facilities and Services Element of the Sonoma County General Plan are relevant to the Project:

Policy PF-2j: Where there is an unmet need for local park facilities, encourage the formation of County service areas or other special districts to meet the need, if economically feasible.

Policy PF-2l: Continue to implement State law pertaining to school impact mitigation that allows for the dedication of land, the payment of fees, or both, as a condition of approval for development projects.

Policy PF-2m: Prepare a Fire Services Master Plan for urban and rural areas in cooperation with the Cities, State, and other fire service agencies. The minimum contents necessary for an adequate master plan are:

1. A statement of objectives, policies and programs,
2. A forecast of growth,
3. Projected fire and emergency medical service needs, and
4. A level of service assessment.

Policy PF-2n: Require prior to discretionary project approval written certification that fire and related services customarily provided to comparable uses are available or will be available prior to occupancy for projects within the service area of the applicable fire agency.

Policy PF-3b: Encourage school districts, the Cities, and the County to work together to provide safe walking and bike paths around schools and neighborhoods.

Policy PF-3m: Consider the needs of youth in transportation planning. Seek youth participation in such decisions.

Policy PF-3o: Consider the needs and limitations of senior citizens and persons with disabilities when planning for public transit routes and equipment.

4.15.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:*

- *Fire Protection*
- *Police Protection*
- *Schools*
- *Parks*
- *Other Public Facilities*

PROJECT IMPACTS AND MITIGATION MEASURES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

- ***Fire Protection***

Once completed, the replacement roadway bridge would not generate additional demand on emergency services and would not substantially reduce existing response times or require the construction of new or altered fire stations. The existing roadway bridge is expected to remain open while construction of the new roadway bridge is ongoing to allow for continued emergency response. Minor short-term delays would be anticipated when the new roadway alignment is tied back into the existing roadway. These delays may result in inadequate emergency access, which is a potentially significant impact. Therefore, Mitigation Measure TRAN-1, from *Section 4.17, Transportation*, would be implemented, which requires the construction contractor to notify emergency service providers of the construction schedule and potential for delays prior to the commencement of construction. With implementation of this measure, no unanticipated emergency vehicle delays would occur as a result of the Project. Therefore, the Project would not result in inadequate emergency access during construction.

Once the new bridge is constructed, emergency vehicles would use the new bridge for access over the creek. The Project construction operations would be required to comply with existing regulations regarding fire safety. Therefore, impacts would be **less than significant**.

Mitigation Measures

No mitigation measures are required.

- ***Police Protection***

Once completed, the replacement roadway bridge would not generate additional demand for police protection and would not substantially reduce existing response times or require the construction of new or altered police stations. The existing bridge would remain open while construction of the new bridge is ongoing to allow for continued law enforcement response. Minor short-term delays would be anticipated when the new roadway alignment is tied back into the existing roadway. These delays may result in delays in law enforcement response time, which is a potentially significant impact. Therefore, Mitigation Measure TRAN-1, from *Section 4.17, Transportation*, would be implemented, which requires the construction contractor to notify police departments of the construction schedule and potential for delays prior to the commencement of construction. With implementation of this measure, no unanticipated law enforcement delays would occur as a result of the Project. Therefore, impacts would be **less than significant**.

Mitigation Measures

No mitigation measures are required.

- ***Schools***

The Project is not a growth inducing Project and would result in ***no impact*** to schools.

Mitigation Measures

No mitigation measures are required.

- ***Parks***

No new parks would be developed as part of the Project and the Project would not increase demand for or use of existing parks and recreational facilities. Therefore, the Project would result in ***no impact*** to parks.

Mitigation Measures

No mitigation measures are required.

- ***Other Public Facilities***

No new public facilities would be developed as part of the Project and the Project would not increase demand for or use of other public facilities such as libraries and emergency medical services. The replacement of the existing one-lane bridge with a modern two-lane facility built to current standards would improve the ability of emergency services to reach the vicinity. Therefore, the Project would result in ***no impact*** to other public facilities**.**

Mitigation Measures

No mitigation measures are required.

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4.16 Recreation

This section describes the existing recreational setting of the Project site, identifies associated regulatory requirements, evaluates potential Project-level impacts, and identifies mitigation measures as necessary to reduce Project impacts related to recreation.

4.16.1 Setting

The nearest existing recreational facility to the Project site is Del Rio Woods, located approximately three miles (14 miles by road) west of the site. Del Rio Woods, located just east of Healdsburg, is owned and managed by Sonoma County Regional Parks. The park offers Russian River beach access and is a popular summer destination for paddling, picnicking, and sunbathing, and a year-round destination for fishing, birding, and wildlife viewing. Amenities include a picnic area with stairway access to the gravel beach, accessible parking, portable restrooms, and drinking fountains (Sonoma County Regional Parks "Del Rio Woods").

The proposed Russian River Water Trail is planned to follow the Russian River, which is located approximately 0.6 mile west (downstream) of the Project site.

4.16.2 Regulatory Setting

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The Sonoma County General Plan Open Space and Recreation Element contains the following relevant policies related to recreation:

> **Policy OSRC-17a:** Apply the "Public-Quasi Public/Park" designation to all existing local, County, and State parklands.
>
> **Policy OSRC-17b:** Apply the "Planned Parks" designation to indicate general areas where a need exists for parks.
>
> **Policy OSRC-17d:** The trails on Figure OSRC-3 make up the County's designated plan for trails. Trail locations are approximate and are described below. Roadways may be used where access cannot be obtained through private property.
>
> - Russian River Water Trail. The Russian River is a navigable waterway from Cloverdale to the coast and as such, public access is protected by Article XV, Section 2 of the California Constitution. This proposed waterway trail extends from the coast to Preston Bridge immediately north of Cloverdale.

4.16.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or,*

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The Project site does not contain any parks or recreational facilities. The nearest existing recreational facility to the Project site is Del Rio Woods, located approximately three miles west of the site (14 miles by road). The nearest planned recreational facility is the proposed Russian River Water Trail, located approximately 0.6 miles west of the Project site. Therefore, the Project would not require closure of recreational facilities which would cause increased use of other such facilities. Access through the Project site would be maintained throughout construction; therefore, access to any parks or recreational facilities in the area would not be limited. As described in *Section 4.14, Population and Housing,* the project would not result in any population growth that could increase the use of existing parks and recreational facilities. Therefore, no substantial physical deterioration of parks and recreational facilities would occur as a result of the Project. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

b) Would the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The Project site does not include any recreational facilities, nor would it construct any recreational facilities. As stated above in Impact a), the Project would not induce increased use of parks and recreational facilities which would necessitate the need for the construction of new facilities. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

4.17 Transportation and Circulation

This section describes the existing setting of the Project site as it relates to transportation and circulation, identifies associated regulatory requirements, evaluates potential Project-level impacts, and identifies mitigation measures as needed to reduce Project transportation impacts.

4.17.1 Setting

EXISTING ROADWAY NETWORK

Coming from the east, regional access to the Project site is provided from State Route 128, then south on Chalk Hill Road. Coming from the west, regional access to the site is from U.S. Highway 101, then east on Shiloh Road, north on Faught Road, and continuing north on Chalk Hill Road.

TRANSIT ACCESS AND CIRCULATION

Based on the *County of Sonoma Bicycle and Pedestrian Plan* (County of Sonoma 2010), bicycle facilities are classified into several types, including:

1. ***Class I Bikeways*** provide a completely separated, exclusive right-of-way for bicycling, walking, and other non-motorized uses.
2. ***Class II Bikeways (bike lanes)*** are striped, preferential lanes for one-way bicycle travel on roadways. Some Class II bikeways include striped buffers that add a few feet of separation between the bicycle lane and traffic lane or parking aisle.
3. ***Class III Bikeways*** are signed bicycle routes where riders share a travel lane with motorists. By law, bicycles are allowed on all roadways in California except on freeways when a suitable alternate route exists. However, Class III bikeways serve to identify roads that are more suitable for bicycles. If an on-street bikeway is not feasible, Class III facilities can also be shared with pedestrians on a sidewalk, although it is not preferred due to the high potential for bicycle/pedestrian conflicts. There are no recommended minimum widths for Class III facilities, but, when encouraging bicyclists to travel along selected routes, traffic speed and volume, parking, traffic control devices and surface quality should be acceptable for bicycle travel.
4. ***Bicycle Boulevards*** are streets that use a variety of traffic calming elements to optimize travel for bicycles rather than automobiles. Conditions optimal for bicycle travel include reduced traffic speed and volume, use of diverters and roundabouts, assigned right of way to the bicycle boulevard at intersections with other roads, traffic controls that help bicycles cross major arterial roads, and signage and street design that encourages bicyclist use and informs motorists that the roadway is a priority route for bicyclists.
5. ***Unpaved recreational trails*** are trails that facilitate pedestrian and bicycle travel but are not included in the bikeways network.

Additional bikeways proposed in the 2010 Bicycle and Pedestrian Plan include 140 miles of Class I bikeways, 90 miles of Class II bikeways, and 91 miles of Class III bikeways. The Bicycle and Pedestrian Plan identifies Chalk Hill Road as a proposed Class III bikeway. There are no existing or proposed pedestrian, bicycle, or public transit facilities at the Project site.

4.17.2 Regulatory Setting

STATE REGULATIONS

California Complete Streets Act of 2008

The California Complete Streets Act of 2008 requires cities and counties to update the circulation element of their General Plans to ensure that streets are planned, designed, and maintained to meet the needs of all users, including motorists, pedestrians, bicyclists, transit riders, children, seniors, and people with disabilities. The goal is to create safe, accessible, and efficient transportation networks that support multiple modes of travel, promote public health, reduce environmental impacts, and enhance overall community livability.

REGIONAL AND LOCAL REGULATIONS

Sonoma County Transportation Authority

The Sonoma County Transportation Authority (SCTA) is overseen by the Sonoma County Board of Supervisors and a twelve-member Board of Directors representing the nine cities of Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor. As the countywide agency responsible for transportation planning and funding, SCTA manages a broad range of activities including advocacy, project oversight, financial planning, grant administration, and research. It also supports the implementation of transportation projects across Sonoma County, covering highways, roads, public transit, and active transportation infrastructure such as bicycle and pedestrian paths. In 2004, Sonoma County voters approved Measure M (the Traffic Relief Act) which established a 0.25-cent sales tax over 20 years to fund transportation improvements. These funds are allocated to specific projects and programs outlined in the voter-approved Expenditure Plan, which was informed by SCTA's 2016 Comprehensive Transportation Plan. This plan sets goals to enhance and maintain all modes of transportation for the efficient movement of people and goods throughout the County.

Sonoma County Bicycle and Pedestrian Plan

The 2010 Sonoma County Bicycle and Pedestrian Plan outlines a comprehensive strategy to improve and expand bicycle and pedestrian infrastructure throughout the County, aiming to create a safer, more connected, and accessible transportation network for non-motorized users. Developed by the SCTA in collaboration with local jurisdictions, the plan identifies priority projects, policies, and programs that support active transportation, reduce vehicle dependence, promote healthy lifestyles, and enhance mobility for all ages and abilities. It aligns with regional and state goals, including those related to climate action, public health, and equity, and serves as a guiding document for securing funding and coordinating implementation efforts across Sonoma County's cities and unincorporated areas.

Sonoma County General Plan

The County's General Plan Circulation and Transit Element contains the following policies that are relevant to the Project:

> **Policy CT-1a:** Design, construct, and maintain the planned improvements for the circulation and transit system as shown on Figures CT-1a through 1i in order to serve the planned travel demand of 546,030 residents and about 289,260 jobs by year 2020.

Policy CT-1h: Avoid construction of circulation and transit system components not identified on Figures CT-1a though CT-1i, and CT-2 that encourage growth in rural areas.

Policy CT-1j: Where practical, locate and design improvements and new circulation and transit facilities to minimize disruption of neighborhoods and communities, disturbance of biotic resource areas, destruction of trees, and noise impacts.

Policy CT-1s: Review all circulation and transit improvements for consistency with the applicable Specific or Area Plan.

Policy CT-3b: Use the policies of the Bikeways Plan whenever reviewing development projects to ensure that projects are consistent with the Bikeways Plan and incorporate necessary bicycle and pedestrian improvements identified in the Bikeways Plan as a condition of project approval.

Policy CT-3d: The Regional Parks Department shall be responsible for establishing and maintaining Class I bikeways, and the Department of Transportation and Public Works (TPW) shall be responsible for establishing and maintaining Class II and III bikeways and pedestrian facilities along public rights-of-way in unincorporated areas.

Policy CT-3h: Develop a Level of Service standard for identifying performance of the bicycle and pedestrian transportation network that takes into consideration travel distance, potential bicycle and pedestrian transportation needs, potential for improved mode split with improved facilities, and existing network deficiencies.

Policy CT-3i: Use the Level of Service standard developed by Policy CT-3h to evaluate impacts to bicycle and pedestrian facilities that may result from discretionary projects, and identify corrections and/or improvements necessary to mitigate those impacts.

Policy CT-3k: Use the most recent version of Chapter 1000 of the Caltrans Highway Design Manual, AASHTO's "Guide for the Development of Bicycle Facilities", and the "California Manual on Uniform Traffic Control Devices" (MUTCD) as general design guidelines for design, construction and maintenance of Sonoma County bikeways.

Policy CT-3l: In addition to the general standards found in Policy CT-3k above, use standards found in the most recently adopted Bikeways Plan for selection, design, construction, and maintenance of Class I, II and III bikeways.

Policy CT-3n: Use the following criteria to determine consistency of public and private projects with the Bikeways Plan:

1. Development of lands traversed or adjoined by an existing or future Class I bikeway shall not preclude establishment of the bikeway, nor conflict with use and operation of the bikeway or adversely affect long term maintenance and safety of the facility.
2. Construction, widening, or maintenance of roads with designated bikeways meets the design and maintenance standards for the appropriate class of bikeway as specified by the Bikeways Plan.

Policy CT-3s: Refer the following projects to the BPAC to review consistency with the Bikeways Plan and to evaluate potential for creating hazards or barriers to walking or bicycling:

1. Road widening projects
2. Road capacity improvement projects.
3. Resurfacing, restoration, and/or rehabilitation of roads with existing or proposed Class II or Class III bikeways.
4. Resurfacing, restoration, and/or rehabilitation of roads that include the installation of rumble strips, AC berms or similar barriers, and/or roadway dots in the shoulder area.
5. Traffic calming improvements.
6. Discretionary projects adjacent to existing or proposed Class I bikeways and/or roads with existing or proposed Class II or Class III bikeways.
7. Discretionary projects anticipated to be conditioned with roadway improvements along existing or proposed Class I, II or III bikeways.

Policy CT-3t: Require that bikeway improvements be included as part of all road maintenance or improvement projects along road segments with existing or proposed bikeways to the maximum extent feasible.

4.17.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

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); or,*
d. *Result in inadequate emergency access.*

APPROACH TO IMPACT ANALYSIS

Section 15064.3 of the State CEQA Guidelines provides that vehicle miles travelled (VMT) is the most appropriate metric for the analysis of transportation impacts under CEQA. VMT measures the amount of driving that a project generates. For example, a project generating 100 total (inbound and outbound) vehicle trips per day with an average of 5.0 miles per trip results in 500 project-generated VMT per day. The impact analysis for traffic and circulation was conducted by evaluating the potential changes to the existing bridge, roadway approaches, and other transportation conditions based on the anticipated project construction activities and proposed project design. Relevant policies and plans related to transportation and circulation issues were also reviewed.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Public Transit Facilities

There are no public transit routes that pass through the Project site. Therefore, the Project would not conflict with any programs, plans, ordinances, or policies addressing public transit facilities. ***No impact*** would occur.

Bicycle and Pedestrian Facilities

The existing bridge does not include any bicycle or pedestrian facilities. Chalk Hill Road is identified as a proposed Class III bikeway by the County's Bicycle and Pedestrian Plan, which are signed bicycle routes where riders share a travel lane with motorists. There are no recommended minimum widths for Class III facilities, but the roadways, traffic control devices, and traffic speeds and volumes should be suitable for bicycle travel. The new bridge will not include any designated bicycle facilities (e.g., bike lanes); however, the design will include a 30-foot clear width, which meets minimum AASHTO standards for an average daily traffic of 400-1,500 and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed-use. There are no existing pedestrian facilities (e.g., sidewalks) within the project site and none are proposed as part of the Project. Therefore, the Project would not conflict with any programs, plans, ordinances, or policies addressing bicycle and pedestrian facilities. The impact would be ***less than significant***.

Construction Traffic

Project-related demolition, excavation, grading, and construction would occur over a two-year timeline to construct the new bridge and demolish the existing bridge. The existing bridge would remain open during the first construction season while the new bridge is built. Once the replacement bridge is constructed, traffic would be switched to the newly constructed replacement bridge and the existing bridge would be demolished. The short-term impacts of detouring traffic would be avoided by keeping the existing bridge open during construction of the replacement bridge. However, minor short-term delays would be anticipated when the new roadway alignment is tied back into the existing roadway. As described in further detail under Impact c), the Project is required to implement traffic safety guidelines in compliance with Caltrans regulations. Safety precautions during on-site construction work would include adequate signage, such as reflective signs, changeable message boards, cones, and barricades. Flagging and other means of traffic control would also be required to allow for the safe movement of traffic through the work zone. With implementation of these measures, no significant traffic impact would occur as a result of construction work. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

CEQA Guidelines section 15064.3(b) describes criteria for analyzing transportation impacts based on VMT. The *Technical Advisory on Evaluating Transportation Impacts in CEQA*, states the if a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that are identified to likely lead to a measurable and substantial increase in

vehicle travel are those that include the addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges.

The Technical Advisory identifies a wide variety of projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis. Among these projects include:

- Rehabilitation, maintenance, replacement and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity.
- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes.
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, or emergency breakdown lanes that are not utilized as through lanes.
- Installation or reconfiguration of traffic calming devices.
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes.
- Rehabilitation and maintenance projects that do not add motor vehicle capacity • Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way.

The proposed Project aligns with several types of projects described above. The Project is a bridge replacement project designed to improve the conditions of the existing transportation system without increasing additional motor vehicle capacity. The existing one-lane bridge would be replaced with a two-lane bridge, which would not result in a net increase in traffic lanes, but would improve safety for crossing vehicles and bicyclists. The Project would also add two four-foot shoulders to the travel lanes across the bridge to enhance safety. Therefore, the Project would not likely lead to a substantial or measurable increase in vehicle travel, and a detailed travel analysis is not required. The Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b); the impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction

During construction, the existing bridge would remain in place to accommodate traffic while the replacement bridge is being constructed on a new downstream alignment adjacent to the existing bridge. Access throughout the project site via Chalk Hill Road and the existing bridge would be maintained throughout while the new bridge is being constructed. Minor short-term delays would be anticipated when the new roadway alignment is tied back into the existing roadway. Once the replacement bridge is constructed, traffic would be switched to the newly

constructed replacement bridge and the existing bridge would be demolished. Staging areas for construction equipment and vehicles would be outside of the roadway; therefore, no hazards would occur due to the presence of construction equipment or vehicles on-site.

The Project is required to implement traffic safety guidelines compatible with Section 12, "Temporary Traffic Control", of the Caltrans *Standard Specification*, and the *California Manual on Uniform Traffic Control Devices* (Caltrans 2014) during construction. Project plans and specifications will require provision of adequate signage and other precautions for public safety during Project construction. Advance warning signs may be reflective signs, changeable message boards, cones, and barricades. Flagging and other means of traffic control would be required to allow for the safe movement of traffic through the work zone.

Therefore, construction of the Project would not substantially increase hazards due to a geometric design feature or incompatible use. Traffic safety controls would be used to prevent hazards associated with construction work on-site. The impact would be ***less than significant***.

Operation and Maintenance

Once the Project is constructed, an additional lane for vehicular travel would exist over the new bridge. Vehicles traveling over the new bridge would no longer have to take turns to cross it, which is a safety improvement compared to existing conditions. The replacement bridge would be built to modern AASHTO standards and would have two 11-foot lanes and two 4-foot shoulders for a total clear roadway width of 30 feet. This 30-foot clear width meets minimum AASHTO standards for an average daily traffic of 400-1,500 and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed-use. The replacement bridge would also have retaining walls constructed along the west side of the approach roadways, which would further enhance safety along the reconstructed approach roadways. Therefore, operation of the Project would not substantially increase hazards due to a geometric design feature or incompatible use. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

d) Would the project result in inadequate emergency access?

As described above, vehicle access through the Project site would be maintained at all times during Project construction. Minor short-term delays could occur when the new roadway alignment is tied back into the existing roadway. Unanticipated delays may result in inadequate emergency access, which is a potentially significant impact. Therefore, Mitigation Measure TRAN-1 would be implemented, which requires the construction contractor to notify emergency service providers of the construction schedule and potential for delays prior to the commencement of construction. With implementation of this measure, no unanticipated emergency vehicle delays would occur as a result of the Project. Therefore, the Project would not result in inadequate emergency access during construction. Once the new bridge is constructed, emergency vehicles would use the new bridge for access over the creek. No operational impacts related to emergency vehicles would occur. Therefore, the Project would not result in inadequate emergency access. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure TRAN-1: Emergency Access

Prior to commencement of construction, the construction contractor shall notify the following emergency service providers (i.e., fire departments, police departments, ambulance, and paramedic services) of the construction schedule and potential for delays:

- Sonoma County Fire District, (707) 838-1170
- Sonoma County Sherriff's Office, (707) 565-2121

4.18 Tribal Cultural Resources

This section describes the existing setting of the Project site as it relates to tribal cultural resources, identifies associated regulatory requirements, evaluates potential Project-level impacts, and identifies mitigation measures needed to reduce potential Project impacts on tribal cultural resources.

4.18.1 Setting

The Project area lies within the area inhabited by the Southern Pomo, whose ethnographic territory extended about 45 miles north from around Santa Rosa to the Sonoma-Mendocino border and from the eastern drainage of the Russian river west to its boundary with the Kashaya (Pomo), with a narrow extension between them to the coast up to Gualala (McLendon and Oswalt 1978). Southern Pomo groups maintained a relatively dense population with complex social structures (Barrett 1908). They had access to diverse resources and planned their subsistence activities around seasonal harvests. For most of the year, they lived in large primary villages accompanied by smaller satellite settlements, but they also moved to seasonal camps to make use of varied resources. Their settlements were concentrated in inland valleys along the Russian River and major creeks.

Pomo groups relied heavily on acorns for their subsistence and would gather and store them to eat throughout the year. The high level of effort required to process the acorns prior to consumption is reflected in their associated technology and practices. The Pomo also used other plants such as buckeye nuts, berries, grasses, roots, bulbs, and edible greens (Bean and Theodoratus 1978). Coastal resources like dried seaweed, kelp, fish (especially salmon and steelhead), and sea mammals supplemented their diet. They also hunted large animals like deer, elk, and antelope, as well as small game and birds. Archaeological findings confirm the use of a wide variety of animal species. Trade also played a vital role in diversifying their diet and obtaining rare items. The Pomo were known for their skill in making clamshell disk beads and magnesite cylinders.

The arrival of Euro-Americans significantly disrupted traditional Pomo life. After Mission Dolores and the San Francisco Presidio were established, Spanish forces began raids for Native converts. By the 1820s, over 600 Pomo had been baptized at the San Rafael and Sonoma missions. Diseases brought by Europeans, including gastroenteritis, respiratory infections, and syphilis, led to population declines, though major epidemics like smallpox were less common in Alta California than in Baja California (Eargle 1986).

Despite the devastating impacts of disease and removal under the reservation system, some traditional Pomo occupations persisted in the region. Over time, many became integrated into the capitalist wage system, but aspects of their cultural heritage remain, as evidenced in the region's Pomo rancherias.

NATIVE AMERICAN CONSULTATION

Native American groups traditionally and culturally affiliated with a geographic area may have expertise concerning their tribal cultural resources. In light of this, Assembly Bill (AB) 52 requires that a lead agency provide written notification of projects to California Native American tribes that have previously requested placement on the agency's notice list. Notice to tribes shall include a brief project description, location, lead agency contact information, and the statement

that the tribe has 30 days to request consultation on the project. The lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a tribe.

A search request of the Sacred Lands File database was sent to the NAHC on April 15, 2018, and a response was received on November 19, 2018. The NAHC's response indicated that sacred sites were identified in the Healdsburg Project area, and that the lead agency should contact the Mishewal-Wappo Tribe of Alexander Valley directly for more information regarding potential sacred sites and tribal cultural resources within the APE. The NAHC also provided a list of contacts for individuals who might have knowledge of tribal cultural resources in the area of the Project, and recommended contacting all those included on the provided list.

The County sent letters to tribes and individuals on the NAHC-provided list on September 25, 2019. The letters included a description of the Project, a summary of the results of the cultural resources records search, and the invitation to consult on the Project. Letters were sent to the following tribes:

- Cloverdale Rancheria of Pomo Indians
- Dry Creek Rancheria Band of Pomo Indians
- Federated Indians of Graton Rancheria
- Kashia Band of Pomo Indians of the Stewarts Point Rancheria
- Lytton Rancheria
- Middletown Rancheria
- Mishewal-Wappo Tribe of Alexander Valley

On October 1, 2019, Buffy McQuillen of the Federated Indians of Graton Rancheria, responded saying that the Tribe has reviewed the location of the Project and determined it to be outside of their traditional ancestral territory, and that they have no further comments on the Project at this time. No other responses were received in response to the letters.

The County reinitiated AB 52 on March 5, 2026, by sending Project notification letters to local tribes. On March 6, Hector Garcia of Graton Rancheria responded to request a copy of the NAHC Sacred Lands File results. The results were sent to Graton Rancheria on March 11, 2026, and the tribe sent a letter requesting tribal consultation to the County on April 8, 2026. The County sent the requested materials to Graton Rancheria on May 8, 2026, and requested dates and times for a consultation meeting. The County followed up via email on June 3, 2026, and June 17, 2026. No response has been received by the tribe to date.

4.18.2 Regulatory Setting

STATE REGULATIONS

Assembly Bill 52 Tribal Consultation (AB 52)

AB 52 (Chapter 532, Statutes 2014), described above, required an update of the CEQA Guidelines to include questions related to impacts to tribal cultural resources. AB 52 establishes a consultation process with all California Native American Tribes on the Native American Heritage Commission List, Federal and Non-Federal Recognized Tribes. AB 52 also establishes a new class of resources: Tribal Cultural Resources. Key components of AB 52 include consideration of Tribal Cultural Values in determination of project impacts and mitigation and required Tribal notice and meaningful consultation.

California Public Resources Code (PRC) Section 21080.3.2(b) states that consultation ends when either 1) parties agree to mitigation measures or avoid a significant effect on a tribal cultural resource, or 2) a party, acting in good faith and after reasonable effort concludes that mutual agreement cannot be reached.

State of California Public Resources Code

Section 21074 of the PRC defines historical resources related to tribal cultural resources.

a) "Tribal cultural resources" are either of the following:

    1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

        A. Included or determined to be eligible for inclusion in the California Register of Historical Resources.

        B. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

    2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Section 5020.1(k) defines "Local register of historical resources" as a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.

Section 5024.1 is the establishment of the California Register of Historical Resources (California Register).

REGIONAL AND LOCAL REGULATIONS

Sonoma County General Plan

The Sonoma County General Plan contains the following policies related to tribal cultural resources:

Policy OSRC-19j: Develop an archaeological and paleontological resource protection program that provides:

(1) Guidelines for land uses and development on parcels identified as containing such resources,

(2) Standard project review procedures for protection of such resources when discovered during excavation and site disturbance, and
(3) Educational materials for the building industry and the general public on the identification and protection of such resources.

Policy OSRC-19k: Refer applications for discretionary permits to the Northwest Information Center to determine if the project site might contain archaeological or historical resources. If a site is likely to have these resources, require a field survey and preparation of an archaeological report containing the results of the survey and include mitigation measures if needed.

Policy OSRC-19l: If a project site is determined to contain Native American cultural resources, such as sacred sites, places, features, or objects, including historic or prehistoric ruins, burial grounds, cemeteries, and ceremonial sites, notify and offer to consult with the tribe or tribes that have been identified as having cultural ties and affiliation with that geographic area.

Policy OSRC-19m: Develop procedures for consulting with appropriate Native American tribes during the General Plan adoption and amendment process.

Policy OSRC-19n: Develop procedures for complying with the provisions of State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, if applicable, in the event of the discovery of a burial or suspected human bone. Develop procedures for consultation with the Most Likely Descendant as identified by the California Native American Heritage Commission, in the event that the remains are determined to be Native American.

4.18.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or,

ii. *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*

PROJECT IMPACTS AND MITIGATION MEASURES

a) Cause a substantial adverse change in the significance of a tribal cultural resources, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

As described above in *Setting,* the County sent Project notification letters to local tribes to invite them to participate in tribal consultation pursuant to AB 52 on September 25, 2019. No requests to consult on the Project were received during the 30-day response period. Due to delays in the Project schedule, tribal consultation pursuant to AB 52 was reinitiated in March 2026. Letters were sent to geographically affiliated tribes on March 5, 2026 via email and U.S. Postal Service, informing tribes that they had 30 days from receipt of the letter to request to consult on the Project.

One response was received from Graton Rancheria requesting a copy of the NAHC Sacred Lands File results, which was sent to the tribe on May 11, 2026. Graton Rancheria followed up with a formal request for consultation letter on April 8, 2026. The County sent the requested materials to Graton Rancheria on May 8, 2026, and requested dates and times for a consultation meeting. The County followed up via email on June 3, 2026 and June 17, 2026. No response has been received by the tribe to date.

As described in *Section 4.5, Cultural Resources,* there is one documented archaeological resource within the APE. This resource is outside the ADI for Project work and would not be damaged by any Project activities. There may be potential for unknown archaeological resources, which may be tribal cultural resources, to be discovered within the Project site during construction, which is a potentially significant impact. As discussed in *Section 4.5, Cultural Resources,* Mitigation Measure CUL-2 would be implemented, which requires specific protocols to be followed in the event of an accidental discovery of archaeological resources during Project construction. Implementation of this measure would ensure that the Project would not have a substantial adverse effect on unknown archaeological resources, including tribal cultural resources, within the Project site.

No other tribal cultural resources were identified during the tribal consultation process. Therefore, the Project would not cause a substantial adverse change in the significance of a tribal cultural resource. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure CUL-2 would be implemented pertaining to the accidental discovery of unknown archaeological resources. Refer to *Section 4.5, Cultural Resources.*

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4.19 Utilities and Service Systems

This section describes the existing utilities setting of the Project site, identifies associated regulatory requirements, analyzes potential impacts related to utilities, and identifies mitigation measures as necessary to reduce Project impacts related to utilities and service systems.

4.19.1 Setting

WATER SUPPLY

Various water districts provide water supply service in unincorporated Sonoma County. Residents in the locality of the Project site rely on wells for water supply.

WASTEWATER COLLECTION AND TREATMENT

Various districts provide wastewater collection and treatment services in unincorporated Sonoma County. The Residents in the locality of the Project site rely on septic systems for wastewater collection.

STORMWATER DRAINAGE

Stormwater from the Project site generally flows into Maacama Creek. There are no stormwater drains or inlets within the Project site. Drainage patterns on the Project site are described in more detail in *Section 4.10, Hydrology and Water Quality.*

ELECTRIC POWER AND NATURAL GAS

SCP and PG&E work together to provide electricity throughout Sonoma County. SCP is the default power generation provider that contracts with power generation plants to source clean and renewable energy. PG&E is responsible for physical delivery and billing of the electricity and also provides natural gas to the County. In 2022, Sonoma County consumed approximately 107 million therms of natural gas and approximately 2880 gigawatt-hours (GWh) of electricity (CEC 2022). Energy is described in further detail in *Section 4.6, Energy*.

TELECOMMUNICATION

As of 2022, a record-high of 95 percent of Californians had access to telecommunication infrastructure, including internet and satellite services (Hayes, Assan, and Gao 2024). The County is located within the 707 area code (CPUC 2025).

The overhead electrical and telecommunication lines above the existing bridge would be relocated to above the new bridge as part of the proposed Project.

SOLID WASTE

The construction contractor selected for the Project would provide solid waste hauling for construction and demolition activities. Nearly all solid waste generated in the County is transported to and disposed of at the Central Landfill, which is located southwest of Cotati, and operated by the Republic Services of Sonoma County, Inc. The landfill and facility site comprise 398 acres, and approximately 173 acres of the site are currently permitted for disposal (CalRecycle 2025). The estimated remaining capacity of the landfill is 8,310,149 tons (CalRecycle 2025).

4.19.2 Water and Groundwater Regulatory Setting

FEDERAL REGULATIONS

Clean Water Act

The federal Clean Water Act (CWA) was enacted by Congress in 1972 and amended several times since. The CWA is the primary federal law that regulates water quality in the U.S., and it forms the basis for several state and local laws throughout the country. The CWA established the basic structure for regulating discharges of pollutants into the waters of the United States. The CWA gave the U.S. EPA the authority to implement federal pollution control programs, such as setting water quality standards for contaminants in surface water, establishing wastewater and effluent discharge limits for various industry contaminants in surface water, establishing wastewater and effluent discharge limits for various industry categories, and imposing requirements for controlling nonpoint-source pollution. At the federal level, the CWA is administered by the U.S. EPA and USACE. At the state and regional levels in California, the act is administered and enforced by the SWRCB and the nine RWQCBs.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) (42 United States Code Section 300(f) et seq.; 40 Code of Federal Regulations (CFR) Section 141 et seq.) regulates public water systems that supply drinking water. The principal objective of the federal SDWA is to ensure that water from the tap is potable (safe and satisfactory for drinking, cooking, and hygiene). The main components of the federal SDWA are to:

1. Ensure that water from the tap is potable
2. Prevent contamination of groundwater aquifers that are the main source of drinking water for a community
3. Regulate the discharge of wastes into underground injection wells pursuant to the Underground Injection Control program (see 40 CFR Section 144)
4. Regulate distribution systems

STATE AND LOCAL REGULATIONS

California Safe Drinking Water Act

The California SDWA (Health & Safety Code Section 116270 et seq.; 22 Cal. Code Regs. Section 64400 et seq.) imposes more stringent regulations on drinking water quality than its federal counterpart. Similar to the federal SDWA, California mandates the establishment of both primary and secondary maximum contaminant levels for pollutants in drinking water; however, some California maximum contaminant levels are more protective of health. The Act also requires the SWRCB to issue domestic water supply permits to public water systems, ensuring compliance with these standards.

Implementation of the federal SDWA is delegated to the states. In California, the SWRCB enforces the federal and state SDWAs and regulates more than 7,500 public water systems across the state. The SWRCB's Division of Drinking Water oversees the State's comprehensive Drinking Water Program, which is the agency authorized to issue public water system permits.

Sustainable Groundwater Management Act

In September 2014, the Governor Jerry Brown signed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act (SGMA) gives local agencies the power to sustainably manage groundwater and requires groundwater sustainability plans to be developed for medium- and high-priority groundwater basins, as defined by the Department of Water Resources (DWR). Please refer to *Section 4.10*, *Hydrology and Water Quality*, for more detailed descriptions of the groundwater basins underlying the Project site.

Urban Water Management Planning Act

The California Legislature enacted the Urban Water Management Planning Act (Water Code, Section 10610 et seq.) in 1983, which requires urban water suppliers to develop Urban Water Management Plans (UWMP) to actively pursue the efficient use of available supplies. Water suppliers must update their UWMP every five years to identify short-term and long-term water demand management measures to meet growing water demands.

Sonoma County General Plan

The General Plan Water Resources Element contains the following relevant policies related to water and groundwater:

> **Policy WR-2a:** Encourage and support research on and monitoring of local groundwater conditions, aquifer recharge, watersheds and streams where needed to assess groundwater quantity and quality.
>
> **Policy WR-2b:** Initiate and support educational programs to inform residents, agriculture, businesses, and other groundwater users of best management practices in the areas of efficient water use, water conservation, and increasing groundwater recharge.
>
> **Policy WR-3a:** Work with public water suppliers in assessments of the sustainable yield of surface water, groundwater, recycled water and conserved water, including during possible drought periods. This work should include the exploration of potentially feasible alternative water supplies. Surface and groundwater supplies must remain sustainable and not exceed safe yields.
>
> **Policy WR-3b:** Support to the extent feasible the actions and facilities needed by public water suppliers to supply water sufficient to meet the demands that are estimated in adopted master facilities plans, consistent with adopted general plans, urban water management plans and the sustainable yields of the available resources and in a manner protective of the natural environment.
>
> **Policy WR-3k:** Cooperate with public water suppliers in the planning, development and construction of the storage and transmission facilities needed to supply water pursuant to adopted General Plan policies, urban water management plans, water supply agreements, master facilities plans and, where applicable, programs to mitigate identified groundwater overdraft conditions.

4.19.3 Public Wastewater Regulatory Setting

STATE AND LOCAL REGULATIONS

Standards for wastewater treatment plant effluent are established using State and federal water quality regulations. After treatment, wastewater effluent is either disposed of or reused as recycled water. The RWQCBs set the specific requirements for community and individual wastewater treatment and disposal and reuse facilities through the issuance of Waste Discharge Requirements, required for wastewater treatment facilities under the California Water Code Section 13260.

The California Code of Regulations Title 22, Division 4, Chapter 3, Sections 60301 through 60355 are used to regulate recycled wastewater and are administered by the RWQCBs. Title 22 contains effluent requirements for four levels of wastewater treatment, from un-disinfected secondary recycled water to disinfected tertiary recycled water. Higher levels of treatment have higher effluent standards, allowing for a greater number of uses under Title 22, including irrigation of freeway landscaping, pasture for milk animals, parks and playgrounds, and vineyards and orchards for disinfected tertiary recycled water.

Sonoma County General Plan

The General Plan Public Facilities and Services element contains the following relevant policy related to wastewater:

> **Policy PF-1a:** Plan, design, and construct sewer services in accordance with projected growth except as provided in Policy LU-4d.
>
> **Policy PF-1d:** Require as part of discretionary project applications within a water or sewer service area written certification that either existing services are available or needed improvements will be made prior to occupancy.

4.19.4 Electric Power and Natural Gas Regulatory Setting

California Energy Commission

The California Energy Commission (CEC) serves as the state's lead agency for energy policy and planning. It works in partnership with state and federal agencies, utilities, and other stakeholders to develop and implement California's energy policies. Since its establishment in 1975, the CEC has focused on reducing electricity and natural gas demand in the state, primarily through the adoption of Building and Appliance Energy Efficiency Standards. These efforts have helped maintain relatively low per capita electricity consumption in California. The CEC is also responsible for the certification and oversight of thermal power plants that produce 50 megawatts or more, including all related project facilities within the state.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) oversees investor owned electric and natural gas utilities operating in California. Its regulatory authority comes from the California State Constitution, including Article Twelve, Section Three, along with various state laws and federal requirements. The Public Utilities Commission regulates natural gas service for roughly 10.8 million customers, including those served by PG&E and other natural gas providers throughout California (CPUC 2020).

4.19.5 Solid Waste and Recycling Regulatory Setting

STATE AND LOCAL REGULATIONS

Resources Code Chapters 476 (Assembly Bill 341) and 295 (Senate Bill 1383)

The purpose of AB 341 of 2011 (PRC Chapter 476, Statutes of 2011) is to reduce GHG emissions by diverting commercial solid waste to recycling efforts and to expand the opportunity for additional recycling services and recycling manufacturing facilities in California. In addition to Mandatory Commercial Recycling, AB 341 sets a statewide goal for 75 percent disposal reduction by the year 2020.

SB 1383 of 2016 (PRC Chapter 395, Statutes of 2016) established the following goals: a 50-percent reduction in the level of the statewide disposal of organic waste from 2014 levels by 2020, and a 75- percent reduction in the level of the statewide disposal of organic waste from 2014 levels by 2025. This bill also authorized CalRecycle to adopt regulations, to take effect on or after January 1, 2022, to achieve these targets.

PRC 41780 (Assembly Bill 939)

AB 939 of 1989 (PRC 41780) requires cities and counties to prepare integrated waste management plans and to divert 50 percent of solid waste from landfills beginning in calendar year 2000 and each year thereafter. AB 939 also requires cities and counties to prepare source reduction and recycling elements as part of the integrated waste management plans. These elements are designed to develop recycling services to achieve diversion goals, stimulate local recycling in manufacturing, and stimulate the purchase of recycled products.

PRC Chapter 727 (Assembly Bill 1826)

AB 1826 of 2014 (PRC Chapter 727, Statutes of 2014) requires businesses that generate a specified amount of organic waste per week to arrange for recycling services for that waste, and that jurisdictions implement a recycling program to divert organic waste from businesses subject to the law. The jurisdictions must report to CalRecycle on their progress in implementing an organic waste recycling program. As of January 1, 2017, businesses that generate four cubic yards or more of organic waste per week shall arrange for organic waste recycling services.

PRC Chapter 343 (Senate Bill 1016)

SB 1016 of 2007 (PRC Chapter 343, Statutes of 2007) requires that 50 percent solid waste diversion requirement established by AB 939 be expressed in pounds per person per day. SB 1016 changed the CalRecycle review process for each municipality's integrated waste management plan. After an initial determination of diversion requirements in 2006 and establishing diversion rates for subsequent calendar years, the Board reviews a jurisdiction's diversion rate compliance in accordance with a specified schedule. Since January 1, 2018, the Board is required to review a jurisdiction's source reduction and recycling element and hazardous waste element once every two years.

Sonoma County General Plan

The General Plan Public Facilities and Services element contains the following relevant policies related to solid waste and recycling:

Policy PF-2p: Amend the CoIWMP as necessary to continue to address potential shortfalls in future landfill capacity.

Policy FP-21: Review projects on or near designated solid waste facilities sites for compatibility with such facilities.

Policy PF-2r: When opportunities occur, the County may acquire buffer zones adjacent to solid waste disposal facilities to help reduce local impacts and provide land for potential environmental mitigation.

Countywide Integrated Waste Management Plan

The Countywide Integrated Waste Management Plan (CoIWMP) a strategic framework for managing solid waste, increasing recycling, and meeting state-mandated diversion goals. Central to the plan is the 2015 Master Operations Agreement, which emphasizes public ownership with private operational support to enhance efficiency, reduce landfill use, and develop in-county infrastructure. The County operates several solid waste facilities, including the Central Disposal Site and multiple transfer stations, and is planning a centralized composting facility to process organic material locally. Guided by the Local Task Force on Integrated Waste Management, the CoIWMP supports greenhouse gas reduction, long-term sustainability, and a diversion rate target exceeding 80 percent.

4.19.6 Telecommunications Facilities Regulatory Setting

STATE AND LOCAL REGULATIONS

Sonoma County General Plan

The General Plan Public Facilities and Services Element contains the following relevant policy related to telecommunications facilities:

Policy PF-2u: Review proposals for public and private telecommunication facilities for consistency with General Plan policies and adopted siting and design criteria. In order for a public telecommunication facility to be found consistent with this plan, it must meet the standards and siting and design criteria of the applicable zoning district.

Policy PF-2v: Consider requiring the undergrounding of new electrical transmission and distribution lines where appropriate in Community Separators, Scenic Landscape Units, along Scenic Corridors and in selected urban areas. Where feasible and under the Public Utility Commission rules, convert existing overhead lines to underground facilities in urban areas.

Policy PF-2w: Encourage consolidation of multiple utility lines into common utility corridors wherever practicable.

4.19.7 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications*

facilities, the construction or relocation of which could cause significant environmental effects;

b) *Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;*
c) *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;*
d) *Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; or,*
e) *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.*

PROJECT IMPACTS AND MITIGATION MEASURES

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

All utilities currently on the existing bridge would require relocation to the proposed new bridge. These utilities include overhead electrical lines and telecommunications lines. Improvements of the existing facilities would be coordinated with utility owners to identify the rights and relocation needs. Relocation of these facilities would be within the Project site and would not cause any significant environmental effects outside of the bridge construction and demolition work. Following Project completion, operation of the new Chalk Hill Road bridge would not require expanded or altered water, wastewater treatment, electric power, natural gas, or telecommunications facilities. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Construction

Water would be required for some construction activities, such as dust control, soil compaction, and cleaning construction areas. The demand for water during construction would be similar to construction water demands for other similar infrastructure projects and would not constitute a significant increase in water demand. The County is responsible for updating their UWMP every five years to plan for projected water supply and demand. Water for construction uses is included in the water demand estimate for the 2020 UWMP. The County's General Plan contains numerous policies related to meeting water demands and exploring options for additional water supplies in drought years. Water required for Project construction is anticipated to be delivered to the Project site by water trucks. No local water sources are anticipated to be utilized. Therefore, the impact of water use during construction on local and regional water supplies would be ***less than significant***.

Operation

Operation and maintenance of the replacement bridge following construction would not cause an increase in demand for water supplies. Water may be used occasionally for future routine maintenance, including pressure washing and other minor water uses; however, this would not result in a significant increase in demand for water supplies. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

c) ***Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?***

The Project would not require determination by the wastewater treatment provider. As described in *Section 4.14, Population and Housing*, the Project would not result in population growth. Therefore, the Project would not result in an increased demand for wastewater treatment. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are required.

d) ***Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?***

Solid waste generated by the Project would be limited to construction and demolition (C&D) waste, including asphalt and concrete, generated by excavation of the existing roadway, construction of the new alignments, and demolition of the existing bridge. Project applicants in the County are required to recycle 100 percent of inert materials (e.g., concrete, asphalt, soil, stone) and 65 percent of all other construction waste. As described below in Impact e), the Project would be required to prepare a recycling plan and track the disposal of all C&D waste. Therefore, the Project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

e) ***Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?***

As stated above in Impact d), the Project would generate C&D waste; therefore, the Project must comply with all recycling and disposal requirements for C&D waste. To help meet state recycling targets, Sonoma County launched the Green Halo construction waste management plan and recycling tool in April 2025 to help streamline the reporting process for C&D waste. After May 5, 2025, all building and demolition projects in the County are required to use the Green Halo web-

based platform to track recycling activities and meet recycling targets. Project applicants are required to recycle 100 percent of inert materials (such as concrete, asphalt, soil, and stone) and at least 65 percent of all other construction waste. A recycling plan must be submitted via Green Halo when applying for a permit and finalized before the permit is closed (Permit Sonoma 2025). As a project generating C&D waste, the Project would be required to prepare a recycling plan and track the disposal of C&D waste using Green Halo. Compliance with these requirements would ensure that the Project would comply with all federal, state, and local management and reductio statutes and regulations related to solid waste. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

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4.20 Wildfire

This section describes the existing setting of the Project site as it relates to wildfire, identifies associated regulatory requirements, analyzes potential impacts related to wildfire, and identifies mitigation measures as necessary to reduce Project impacts related to wildfire.

4.20.1 Setting

OVERVIEW OF WILDFIRE

A wildfire is a fire that spreads uncontrollably through large areas of flammable vegetation. Unlike other types of fires, wildfires typically occur in environments such as grasslands, woodlands, brushlands, scrublands, peatlands, and similar vegetated landscapes that provide natural fuel. When wildfires expand toward developed areas, they can also engulf buildings and infrastructure.

Several key factors contribute to a region's vulnerability to wildfires, including terrain and slope, the type and condition of vegetation, and prevailing weather and atmospheric conditions. The Governor's Office of Land Use and Climate Innovation (formerly the Office of Planning and Research) has noted that while densely built areas can experience significant structure-to-structure losses, homes located in low- to moderate-density developments are often at greater risk of burning. This increased risk may be due to their proximity to wildland vegetation and limited accessibility for firefighting efforts. Additionally, fire occurrence tends to be highest in these lower-density zones, particularly in regions where human activity is the main cause of ignition (California Natural Resources Agency 2018).

Wildfires also have far-reaching secondary effects. Beyond the immediate destruction of vegetation and forests, intense fires can severely impact soil, water systems, and the broader environment. Heat-damaged soil may lose its ability to retain water and support plant life. Without vegetation cover, soil erosion accelerates, contributing to sediment buildup in rivers and streams. This can increase flood risk, harm aquatic ecosystems, and degrade water quality. Landscapes stripped of plant cover are also more prone to hazardous debris flows.

Between 1964 and 2020, Sonoma County experienced 23 significant wildfires, either due to their size or cost (County of Sonoma 2021). From 2017 to 2020, a series of large wildfires burned over 300,000 acres in Sonoma County, destroying nearly 7,000 structures and causing 24 fatalities. The 2020 Glass Fire and LNU Lightning Complex Fire burned a total of 124,000 acres and resulted in over 900 damaged structures. The 2019 Kincade fire burned 77,800 acres and damaged 371 structures. In 2017, the 2017 Sonoma Complex Fires burned more than 86,000 acres, and destroyed approximately 5,300 homes. That same year, the Tubbs Fire burned 36,800 acres but was particularly destructive, burning over 5,640 structures.

Eastern Sonoma County, with its rugged terrain and dense, flammable vegetation, is classified as having a "high" to "very high" Fire Hazard Severity Zone (FHSZ) by CAL FIRE (2024b). Communities located near these high-risk areas include Cloverdale, Geyserville, eastern Santa Rosa, and the city of Sonoma.

Slope and Aspect

Fire typically burns more quickly and intensely up steep slopes due to the preheating of vegetation above the flame. Heat from the downslope fire rises, warming and drying out fuels on the slope ahead of the fire, making them more flammable (East Bay Municipal Utility District

2025). Slopes can also hinder firefighting efforts due to the lack of roads or accessible paths that make it difficult for fire crews, equipment, and vehicles to reach the fire line. Steep slopes also present post-fire hazardous effects, as they are more prone to erosion and debris flows in the absence of vegetation burned by a fire. Aspect refers to the compass direction a slope faces and influences the amount of solar radiation it receives. Slopes oriented towards the south or southwest are exposed to more sunlight, making them warmer and causing vegetation to dry out more quickly. In contrast, slopes facing north or northeast receive less sunlight and tend to retain more moisture. As a result, south- and southwest-facing slopes have a higher risk of wildfire ignition and spread (University of California 2018).

The Project site is located approximately four air miles east of Healdsburg in a rural residential and agricultural area. Topography of the Project site is relatively flat; however, there are steep slopes (>15 percent) along the eastern side of Chalk Hill Road adjacent to the site.

Vegetation

Vegetation serves as the primary fuel for wildfires, and it changes temporally with seasonal growth and die-back. Some vegetation types are naturally resistant to fire, while others are highly flammable. In California, some native plants are adapted to resist burning, while others actually rely on fire as part of their reproductive cycle, using heat to trigger seed germination.

The behavior of wildfire is largely influenced by the types of fuel available. Wildland fuels are grouped into fuel types based on the primary fuel that carries the fire, as fuel types create different fire behavior. Typical fuel groups include grass, grass-shrub, shrub, timber-understory, timber litter, and slash-blowdown. Fires are also influenced by fuel loading (the among of fuel present in an area) and fuel availability (how ready a fuel is for burning). Fuel availability accounts for some of the characteristics of vegetation that make them more susceptible or resistant to burning (Northwest Fire Science Consortium undated).

As described in *Section 4.4, Biological Resources,* there are more than 10 vegetation cover types within the BSA. Aside from ruderal and developed areas which make up 4.34 acres of the BSA, the most prominent vegetation cover classes are wild oats grassland (3.44 acres), mixed oak woodland (1.20 acres), valley oak woodland (0.94 acres), arroyo willow thicket (0.77 acres), and coast live oak woodland (0.71 acres). The wild oats grassland area is located in the southwestern portion of the BSA, which would mainly be used for construction staging areas. The majority of project work would occur around Maacama Creek and the intersection of Chalk Hill Road and Young Road, which is made up of wet, riparian forest vegetation.

Weather and Atmospheric Conditions

Wind, temperature, and relative humidity are the key weather factors that influence how wildfires behave and how likely they are to ignite (National Park Service 2017). Fires tend to spread more rapidly when conditions are hot, dry, and windy. Wind not only accelerates the movement of flames but can also carry burning embers over long distances, sparking new fires ahead of the main blaze. Prolonged drought intensifies these risks by drying out vegetation, increasing the amount of available fuel, and raising the likelihood of ignition.

Sonoma County's weather plays a critical role in wildfire risk, particularly during the late summer and fall when temperatures are high, humidity is low, and strong winds are more frequent. Inland areas often see daytime highs between 80° and 100°F during fire season, with relative humidity dropping to 20–35 percent. These dry, warm conditions cause vegetation to become highly flammable, especially after months without significant rainfall. While coastal areas may benefit

from fog and higher nighttime humidity recovery, inland valleys and higher elevations remain much drier, increasing the potential for rapid fire spread (Fire Safe Sonoma 2016).

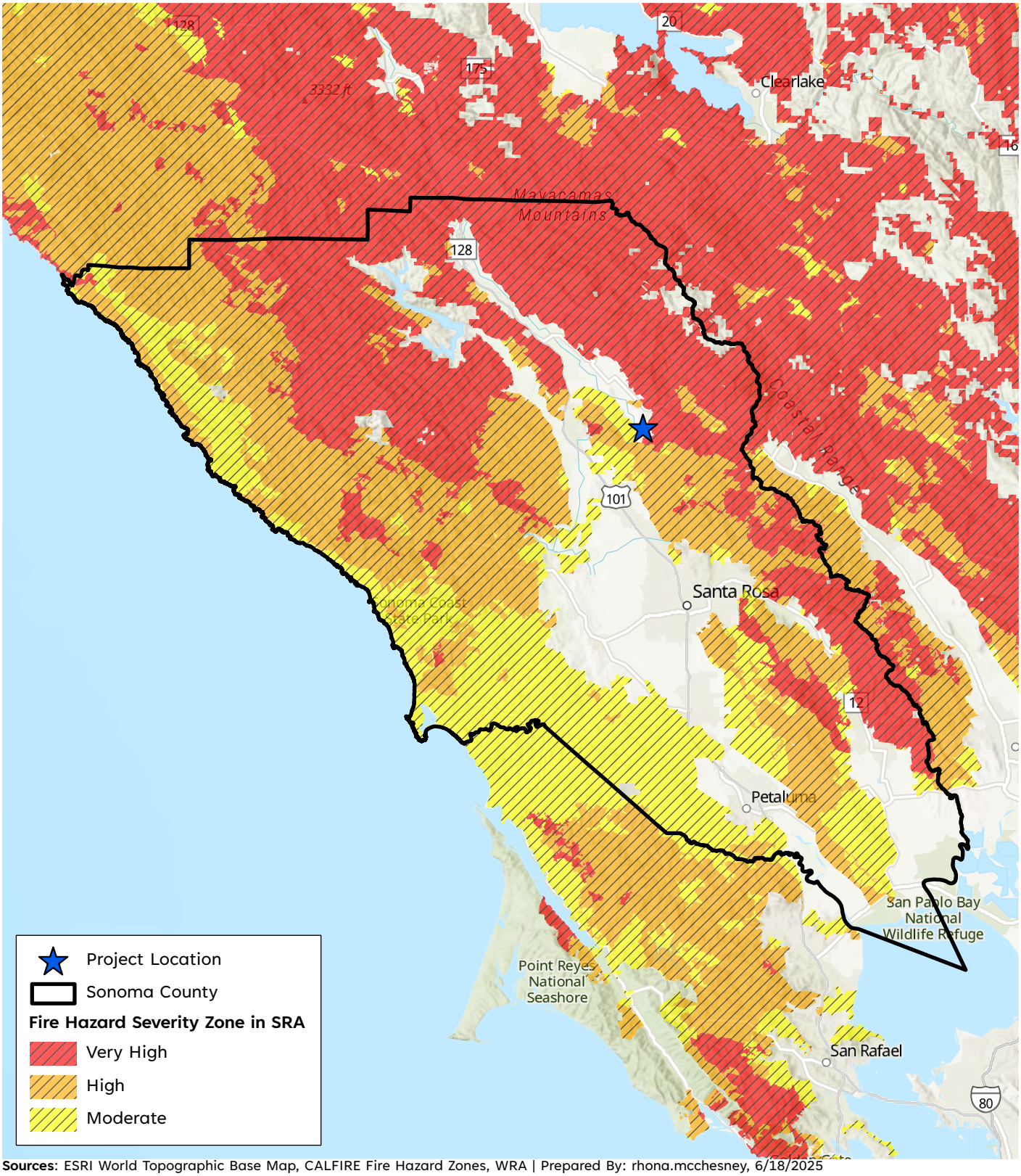
Sonoma County is especially vulnerable to powerful Diablo wind events, which can produce gusts exceeding 70–90 miles per hour, as seen during the 2019 Kincade Fire (SCDEM 2020). These winds, combined with parched vegetation and low humidity, can turn a small spark into a fast-moving wildfire, prompting widespread evacuations and threatening communities. As climate trends point toward warmer, drier summers with more frequent strong winds, the risk of large, destructive wildfires in Sonoma County continues to rise.

WILDFIRE HAZARDS

In California, wildfire prevention and suppression efforts are a shared responsibility among federal, state, and local agencies. Federal agencies manage lands within Federal Responsibility Areas, which include national forests and other federally owned properties. The State of California oversees certain non-federal lands—particularly those in unincorporated areas that have critical watershed or natural resource value—designated as State Responsibility Areas (SRAs). These areas fall under the jurisdiction of CAL FIRE. Meanwhile, lands within incorporated cities and some unincorporated zones are classified as Local Responsibility Areas (LRAs) and are managed by local governments.

State law requires CAL FIRE to assess and map areas of significant wildfire hazard by analyzing factors such as vegetation, topography, weather patterns, and fuel conditions (Public Resources Code §§ 4201–4204; Government Code §§ 51175–51189). These areas are mapped into Fire Hazard Severity Zones (FHSZs). In SRAs, CAL FIRE identifies three levels of hazard: *Moderate*, *High*, and *Very High*. CAL FIRE also recommends *Very High* FHSZs in LRAs, which may be officially adopted by the local agency.

The designation of an area within a FHSZ influences how buildings must be constructed and how vegetation must be managed to reduce wildfire risk. Specifically, properties in *Very High* FHSZs are subject to stricter state regulations concerning fire-resistant construction materials and defensible space standards, all aimed at minimizing property loss and protecting lives during wildfire events. Figure 4.20-1 shows the FHSZs across Sonoma County and Figure 4.20-2 shows the FHSZs at the Project site. The project site is on the border of an LRA and SRA, with the majority of the Project site mapped as a *Moderate* FHSZ in the LRA, and areas along the eastern boundary of the Project site within a *Very High* FHSZ in the SRA.



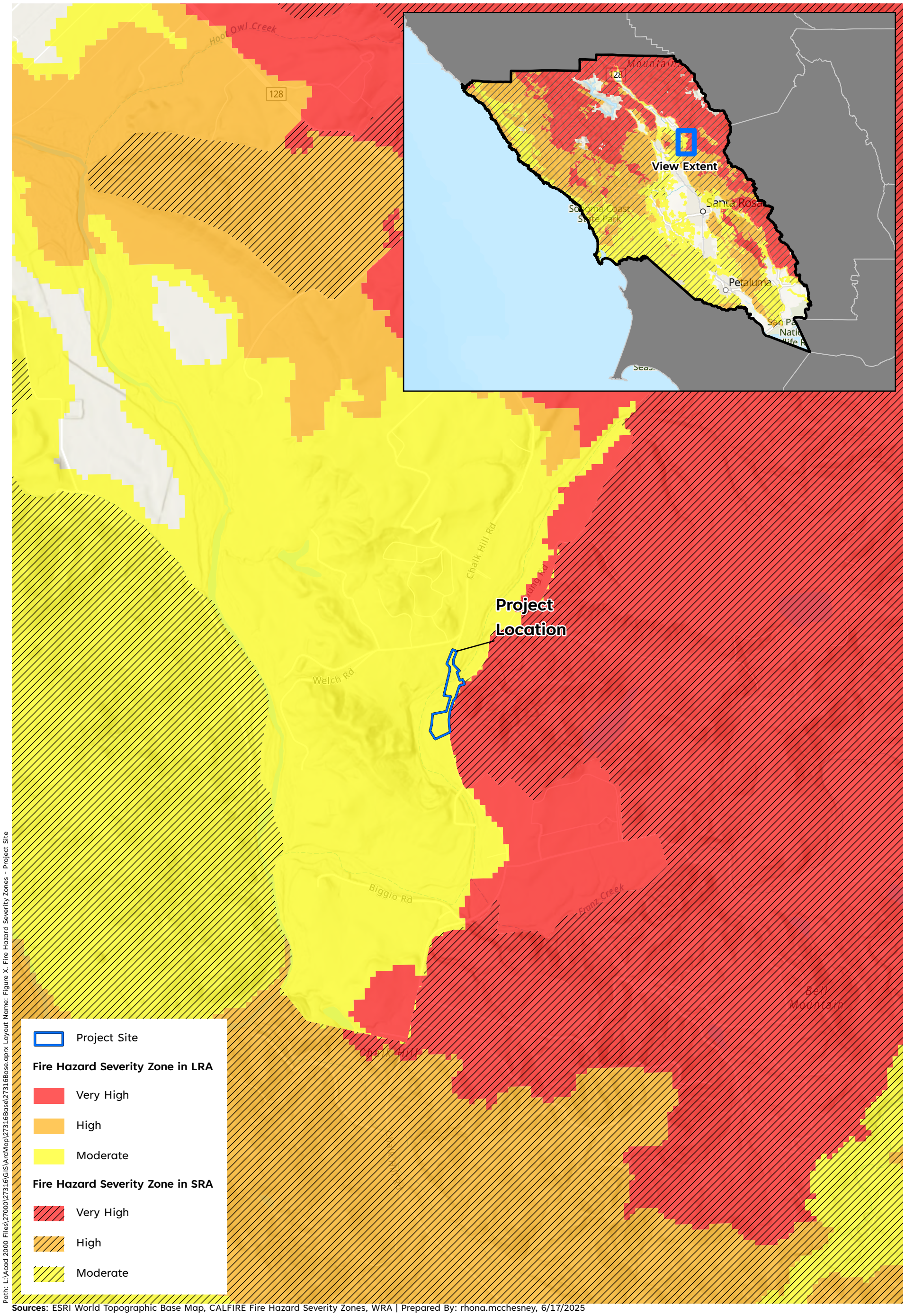
Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: Figure X. Fire Hazard Severity Zones - Countywide

Sources: ESRI World Topographic Base Map, CALFIRE Fire Hazard Zones, WRA | Prepared By: rhona.mcchesney, 6/18/2025

Figure 4.20-1. Fire Hazard Severity Zones - Countywide

Chalk Hill Road Bridge Replacement
Sonoma County, California

wra Environmental Consultants



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: Figure X. Fire Hazard Severity Zones - Project Site

Sources: ESRI World Topographic Base Map, CALFIRE Fire Hazard Severity Zones, WRA | Prepared By: rhona.mcchesney, 6/17/2025

Figure 4.20-2. Fire Hazard Severity Zones - Project Site

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 0.25 0.5 Miles

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4.20.2 Regulatory Setting

FEDERAL REGULATIONS

The Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 mandates that states maintain a mitigation plan in order to qualify for federal disaster assistance. There are two classifications of these plans: Standard and Enhanced. States with an approved Enhanced Mitigation Plan are eligible to receive higher levels of funding through the Hazard Mitigation Grant Program (HMGP). In addition to state requirements, the Act also introduced updated guidelines and obligations for the development of local hazard mitigation plans.

National Fire Plan

The National Fire Plan, created in August 2000 in response to an unprecedented wildfire season, was designed to strengthen the nation's ability to respond to severe wildfires and protect affected communities. Its goals include ensuring adequate firefighting resources and addressing key areas such as wildfire suppression, post-fire rehabilitation, hazardous fuels management, community support, and program accountability.

STATE REGULATIONS

California Board of Forestry

The Board of Forestry oversees fire safe road standards outlined in Title 14 of the CCR. These regulations set specific requirements for elements such as road width, surface conditions, grade, curve radius, turnouts, turnarounds, driveways, gate access, and related structures. The primary purpose of these rules is to ensure that emergency wildfire response vehicles can access properties safely and that residents have reliable evacuation routes during fire emergencies.

California Fire and Building Codes (2019)

The California Fire Code, located in Title 24, Part 9 of the CCR, sets minimum standards to protect public health, safety, and welfare from fire, explosions, and other hazardous conditions in both new and existing buildings and properties. It aligns with nationally recognized best practices and supports emergency operations by ensuring safer environments for firefighters and first responders.

The Fire Code is the primary legal tool for regulating the safe use, handling, and storage of hazardous materials at fixed facilities. It works alongside the California Building Code (CBC) using a hazard classification system to determine the level of fire and life safety protection required. These protections may include specific construction standards, minimum distances from property lines, and the use of specialized equipment. Compliance is enforced through a permit system based on hazard type.

The Fire Code governs nearly all aspects of a building's lifecycle, including construction, alteration, occupancy, equipment use, maintenance, and demolition. Specific chapters of the Code address critical fire safety topics:

- Chapter 7 – Fire-resistance-rated construction
- Chapter 8 – Interior finishes related to fire safety

- Chapter 9 – Fire protection systems
- Chapter 10 – Means of egress and emergency access road requirements

Section 4906 covers regulations for vegetation and fuel management to reduce fire risk around structures.

In addition, Chapter 7A of the CBC (Title 24, Part 2) focuses on materials and construction techniques for resisting wildfire exposure. These standards apply to buildings located in FHSZs within SRAs and in Wildland-Urban Interface (WUI) areas. The code mandates ignition-resistant construction practices for new buildings in regions where dense development borders flammable vegetation.

The California Fire Plan

The Strategic Fire Plan for California serves as the state's comprehensive framework for reducing wildfire risk. The most recent version of the plan, finalized in August 2024, directs each CAL FIRE Unit to update its own locally tailored Fire Management Plan (CAL FIRE 2024a). These unit-specific plans assess wildfire conditions across all 21 CAL FIRE units and six contract counties. They address key elements such as wildfire protection areas, wildfire prevention, the success of initial attack efforts, assets and infrastructure at risk, pre-fire management strategies, and accountability measures within each geographic area.

California Office of Emergency Services

The California Office of Emergency Services (CalOES) is responsible for developing the State of California Multi-Hazard Mitigation Plan (SHMP). This plan identifies potential hazards, assesses vulnerabilities, and outlines strategies to reduce risks across the state. The SHMP is a federal requirement under the Disaster Mitigation Act of 2000 and is necessary for California to qualify for federal disaster assistance and mitigation funding.

State Emergency Plan

California’s emergency planning and response system is built on a statewide mutual aid framework designed to ensure that sufficient resources, facilities, and support are available when local jurisdictions are unable to manage emergencies on their own. This system is governed by the California Disaster and Civil Defense Master Mutual Aid Agreement (Government Code Sections 8555–8561), which requires all signatories to develop operational plans for use both within their own jurisdiction and when providing aid to others. These plans cover both fire and non-fire emergencies, including natural disasters, technological incidents, and wartime scenarios. The agreement, signed in 1950, includes the State of California, all state agencies, political subdivisions, and fire districts.

Under Section 8568 of the California Government Code, part of the California Emergency Services Act, the State Emergency Plan must be in effect across all political subdivisions. Local governments are required to take the necessary actions to implement the plan's provisions. The Act grants the legal authority for emergency operations following an official emergency declaration by the Governor or a designated local official, such as a city manager. It also outlines the responsibilities and functions of government agencies at all levels during large-scale emergencies, including those related to war.

All local emergency plans are considered extensions of the State Emergency Plan. The State Emergency Plan conforms to California’s Standardized Emergency Management System (SEMS), established pursuant to Government Code Section 8607(a), which provides a standardized

framework for managing emergencies involving multiple jurisdictions or agencies. SEMS incorporates key components such as the Incident Command System (ICS), the Master Mutual Aid Agreement and related mutual aid protocols, the operational area concept, and multiagency or interagency coordination. Local governments must use SEMS to be eligible for state funding of response-related personnel costs under disaster assistance programs (CalOES 2024).

SEMS operates through five organizational levels, activated as needed: field response, local government, operational area, regional, and state. To support coordination, CalOES has divided California into several mutual aid regions. Sonoma County is part of Mutual Aid Region II, which also includes the counties of Del Norte, Humboldt, Mendocino, Lake, Napa, Marin, Solano, Contra Costa, San Francisco, San Mateo, Alameda, Santa Clara, Santa Cruz, San Benito, and Monterey. (CalOES 2025).

Government Code Sections 65302 and 65302.5, Senate Bill 1241 (Kehoe) of 2012

Senate Bill (SB) 1241 requires cities and counties to address fire risk in SRAs and Very High FHSZs in the safety element of their general plans. The bill also amended CEQA to direct amendments to the CEQA Guidelines Appendix G environmental checklist to include questions related to fire hazard impacts for projects located in or near lands classified as SRAs and Very High FHSZs. In adopting these Guidelines amendments, the Governor's Office of Planning and Research recognized that generally, low-density, leapfrog development may create higher wildfire risks than high-density, infill development.

California Public Utilities Commission General Order 166

California Public Utilities Commission (CPUC) General Order 166 establishes emergency planning and response standards for investor-owned utilities (IOUs). Under Standard 1.E, IOUs are required to develop a Fire Prevention Plan that outlines general strategies to reduce the risk of power line-related wildfires. This includes specific protocols for mitigating fire risk during Red Flag Warnings in high fire threat areas, especially when wind conditions exceed the structural design limits of power lines. The plan must also identify locations within the utility's service area where these high-risk conditions are likely to occur simultaneously.

The CPUC and CAL FIRE worked together to build a Fire Threat Map, which identified high wildfire risk areas, particularly related to overhead utilities. The Project site is within a Tier 2 CPUC High Fire Threat District (CPUC 2021).

REGIONAL AND LOCAL REGULATIONS

Sonoma County Multi-Jurisdictional Hazard Mitigation Plan

The County of Sonoma's MJHMP 2021 Update outlines a long-term strategy for reducing the impacts of natural and human-caused hazards throughout the County. The plan identifies potential threats such as wildfires, floods, earthquakes, and hazardous materials incidents, and proposes actions to minimize risks to life, property, and critical infrastructure. Given the increasing frequency and severity of wildfire events in the region, the plan identifies wildfire as one of the county's most significant threats and outlines targeted actions to reduce vulnerability. These include vegetation management, defensible space measures, public education, and improvements to emergency warning systems. The plan supports coordination among local jurisdictions, special districts, and unincorporated areas, and helps ensure continued eligibility for state and federal funding to implement wildfire mitigation projects and enhance community resilience.

Sonoma County Community Wildfire Protection Plan

The Sonoma County Community Wildfire Protection Plan (CWPP) was developed with input from many organizations, including state and local fire departments, federal agencies, community groups, and land management agencies. The purpose of the Sonoma County CWPP is to help reduce the potential loss of human life and damage to property, natural and cultural resources within Sonoma County due to wildfire. The plan describes the wildfire risk and potential throughout the County, designates WUI areas, discusses assets at risk throughout the County, provides mitigation strategies, and discusses resources available. The CWPP was incorporated by reference into the Sonoma County Annex of the MJHMP in 2023.

Sonoma County Emergency Operations Plan

The County's Emergency Operations Plan outlines the response strategy for major emergencies and disasters affecting the entire County, including all cities, special districts, and unincorporated areas. The plan is designed to enhance public safety and reduce property and environmental damage by coordinating emergency response efforts, setting clear priorities, and ensuring the public receives timely and accurate information.

Sonoma County General Plan

The General Plan emphasizes that in order to reduce wildfire risk in rural areas, the type and intensity of land use should be carefully limited. While certain mitigation measures such as vegetation clearance and the installation of reliable water supply systems can help lower fire risk, they cannot eliminate it entirely. Rural development should be most constrained in areas where natural fire hazards are severe, fire protection services are limited, and poor road access hinders both emergency response and resident evacuation. Accordingly, the General Plan applies land use and density restrictions in high-risk zones to minimize the number of people and structures exposed to wildfire hazards.

The Sonoma County General Plan Public Safety Element contains the following relevant policies related to wildfire:

> **Policy PS-3a:** Continue to use available information on wildland and structural fire hazards.
>
> **Policy PS-3b:** Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with the Public Safety Element in the review of projects.
>
> **Policy PS-3f:** Encourage strong enforcement of State requirements for fire safety by the California Department of Forestry and Fire Protection.
>
> **Policy PS-3j:** Provide fire hazard information signs in Very High or High Fire Hazard Severity Zones in a manner consistent with Area Plans and that does not degrade Scenic Corridors and scenic views.
>
> **Policy PS-3l:** Require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural exempt buildings.

Sonoma County Fire Prevention Division

The Sonoma County Fire Prevention Division is tasked with implementing programs, procedures, and initiatives aimed at preventing fires in the county's unincorporated areas. Its primary objective is to reduce the risk to life and minimize property damage when fires do occur. In addition to enforcing fire codes, the Division's responsibilities include responding to hazardous materials incidents, conducting fire investigations, supporting emergency scene management, and reviewing permit applications for new developments.

Sonoma County Department of Emergency Management

The Sonoma County Department of Emergency Management oversees mitigation, preparedness, response coordination, planning, and recovery efforts for emergencies and disasters within the county. It serves as the central coordinating agency for emergency management activities that impact multiple jurisdictions, as well as those occurring in unincorporated areas. The Department was established as an independent county agency in July 2019.

4.20.3 Environmental Impact

THRESHOLDS OF SIGNIFICANCE

Consistent with State CEQA Guidelines Appendix G Environmental Checklist, the project would have a significant impact if it would:

a) *Substantially impair an adopted emergency response plan or emergency evacuation plan;*
b) *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;*
c) *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or,*
d) *Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.*

APPROACH TO IMPACT ANALYSIS

Impacts related to wildfire hazards and risks were evaluated using FHSZ mapping for Sonoma County, aerial imagery, topographic mapping, and vegetation mapping. Additionally, weather patterns related to prevailing winds and precipitation trends were evaluated as they relate to the spread and magnitude of wildfire. CEQA does not generally require an agency to consider the effects of existing environmental conditions on a proposed project's future users or residents. Consequently, impacts under the thresholds identified below would only be considered significant if the proposed Project risks exacerbating those existing environmental conditions.

PROJECT IMPACTS AND MITIGATION MEASURES

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

The Project would involve replacement of the Chalk Hill Road bridge over Maacama Creek, which provides access from rural communities of Alexander Valley to the central County areas of Windsor, Mark West Springs, Healdsburg, and Santa Rosa. In the event of a wildfire spreading from northern or eastern areas of the County, Chalk Hill Road would be a critical evacuation

route from rural communities of Alexander Valley. As discussed in *Section 4.17, Transportation,* access over Maacama Creek via Chalk Hill Road would be maintained at all times throughout Project construction. The existing bridge would remain in service during the first construction season while the new bridge is being built, and traffic would be switched onto the new bridge at the end of the first construction season. Minor short-term delays could occur when the new roadway alignment is tied back into the existing roadway. However, the Project would implement Mitigation Measure TRAN-1 which requires the construction contractor to notify emergency service providers of the construction schedule and potential for delays. With implementation of this measure, the Project would not substantially impair an adopted emergency response plan or emergency evacuation plan. The impact would be ***less than significant with mitigation incorporated***.

Mitigation Measures

Mitigation Measure TRAN-1 would be implemented to reduce potential Project impacts to a less-than-significant level. Refer to *Section 4.17, Transportation*.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The Project site is mapped within a *Moderate* FHSZ within the LRA, and a *Very High* FHSZ within the SRA. The Project site is in a relatively flat area although steep slopes border the site to the east. During construction, there is potential for equipment used to create sparks which could pose an exacerbated fire risk. Construction activities would follow all relevant policies and regulations and implement BMPs to ensure fire safety and stop the spread of fire in case of ignition, including contacting the local fire department, if ignition should occur. The Project site is not surrounded by substantial amounts of dry combustible materials which would ignite and spread fire quickly. While there is grassland vegetation on-site, the majority of Project work would be located near wet, riparian areas of Maacama Creek. Once the new bridge is operational and demolition of the existing bridge is complete, wildfire risks in the Project area would not be exacerbated. The wildfire risk would remain similar to the baseline environmental conditions at the site. Therefore, construction of the Project would not exacerbate wildfire risks and expose Project occupants to pollutant concentrations from wildfire or the uncontrolled spread of wildfire. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

As discussed in *Section 4.19, Utilities and Service Systems,* utility power lines would have to be relocated to accommodate the new bridge alignment. This work would not exacerbate fire risk because the work would comply with current regulatory requirements for safety as well as Sonoma County policies that ensure that fire suppression services are available at all times to meet the needs of County residents. Relocation of existing overhead utilities would not cause a

significant increase or expansion of use that would result in temporary or ongoing impacts beyond the environmental baseline conditions. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The Project would not result in downslope or downstream flooding or landslides, as a result of runoff, post-fire instability, or drainage changes. As discussed in *Section 4.10, Hydrology and Water Quality,* the Project would result in some changes to drainage patterns on-site; however, these changes would be minor and would not cause significant risks. Furthermore, the Project would implement a SWPPP during construction which would include erosion control BMPs to stabilize soils that are exposed from construction work. After construction is finished, all graded areas would be replanted with native vegetation to help restabilize slopes in the long-term. The impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

5.0 CUMULATIVE IMPACTS

5.1 EIR Requirements

CEQA Guidelines Section 15130 states that "An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065(a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable."

The purpose of this section is to provide an analysis of cumulative impacts as they relate to each environmental topic area outlined in the CEQA Appendix G Guidelines. A project's impacts are "cumulatively considerable" if the "incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (CEQA Guidelines Section 15065(a)(3)).

5.2 Analysis of Cumulative Impacts

5.2.1 Methodology

The scope of cumulative impacts for each environmental issue area differs based on the type of issue being identified and the local context of the environmental topic area. The scope of cumulative impact analysis for each issue area is identified under the respective analysis in *Environmental Issue Areas*, below.

5.2.2 Environmental Issue Areas

AESTHETICS

The geographic scope for cumulative aesthetics and visual quality impacts for this Project would be the publicly accessible viewshed of the Project. No other projects exist or are currently proposed at the Project site that impact the viewshed of the Project site. There would be no cumulative development facilitated by the Project. The replacement bridge would function in the same manner as the existing bridge and would not create new impacts related to light or glare. The need for maintenance of the bridge would be reduced compared to the current baseline, hence limiting visual obstructions caused by the future presence of construction equipment at the site. Therefore, the impact of the Project related to aesthetics would be less than cumulatively considerable.

AGRICULTURE AND FORESTRY

The geographic scope for cumulative agricultural and forestry resource impacts includes the Project site and surrounding parcels, all of which are zoned for Land Intensive Agriculture. No other projects exist or are currently proposed that would impact any agricultural lands surrounding the Project site. There would be no cumulative development facilitated by the Project. The Sonoma County General Plan contains policies that aim to preserve agricultural lands within the County, which would be applicable to all future development in the Project area. Therefore, the impact of the Project related to agriculture and forestry resources would be less than cumulatively considerable.

AIR QUALITY

The geographic scope for cumulative air quality impacts is the North Coast Air Basin under the jurisdiction of the NoSoCo Air District. The North Coast Air Basin meets all established air quality standards and therefore, has not established CEQA thresholds of significance for cumulative air quality impacts. Because the North Coast Air Basin is adjacent to the San Francisco Bay Area Air Basin, the Bay Area Air District's air quality significance thresholds were used for the cumulative air quality impacts analysis. As described in *Section 4.3, Air Quality*, the Bay Area Air District does not have a significance threshold for air quality impacts for construction projects and considers the implementation of dust control measures enough to reduce air quality construction impacts to less-than-significant levels. The Project would implement the Bay Area Air District-recommended dust control measures as Mitigation Measure AIR-1; therefore, construction of the Project would not result in a cumulatively considerable air quality impact. Operation of the Project would not result in any air quality impacts because the project would not increase vehicle travel or facilitate development in the Project area. Therefore, the impact of the Project related to air quality would be less than cumulatively considerable.

BIOLOGICAL RESOURCES

The geographic scope for cumulative biological resources impacts for jurisdictional features and special-status aquatic plant and wildlife species is considered suitable habitat within the Russian River Watershed. The cumulative setting for special-status terrestrial plant and wildlife species is considered suitable habitat in Sonoma County.

Existing and continuing development could contribute to cumulative impacts on jurisdictional features. Habitat removal and fragmentation from current and future development in the area is the biggest threat to plant and wildlife species. Wildlife is also impacted by collisions with human structures and equipment, poisoning by pesticides and contaminants, damming and diverting of rivers and streams, predation by domestic animals, and disease.

The Project would include removal of an existing structurally deficient bridge and replacement with a new bridge. Although the Project would minimally increase the footprint of human disturbance locally, the Project would not facilitate new commercial or residential development in the Project vicinity, nor would it increase the capacity of the roadway, thus encouraging future growth in the area.

Construction of the Project would have temporary and permanent impacts on special-status natural communities identified by the CNDDB including perennial stream, mixed oak woodland, California bay riparian, valley oak woodland, valley oak – Oregon ash woodland, purple needlegrass grassland, and jurisdictional water features including intermittent stream of Maacama Creek, that are also considered special-status communities. Riparian habitat is also considered a locally important vegetative community. However, given the relatively small size and scale of the Project within the overall region, and with the implementation of mitigation measures described in *Section 4.4, Biological Resources*, the Project would make a minimal contribution to cumulative impacts on sensitive natural communities, jurisdictional features, or locally important habitats.

Construction of the Project could result in direct and indirect impacts on special-status plant and wildlife species. However, with the implementation of Project design features and mitigation measures to prevent and minimize adverse impacts, the Project would have a minimal contribution to cumulative impacts on plant and wildlife species. In addition to the mitigation

measures included in this EIR, the Project would be required to implement any additional measures stipulated by regulatory agencies with jurisdiction over the Project.

There are no other known existing or planned projects in the vicinity of the BSA. Therefore, the impact of the Project related to biological resources would be less than cumulatively considerable.

CULTURAL RESOURCES

The geographic scope for cumulative cultural impacts is the County of Sonoma, specifically historic bridge projects in the County. This cumulative impact scenario considers other County projects that have the potential to impact historic bridges in the County.

The Project would remove and replace the existing Maacama Creek bridge that is included in a Historic Bridge Thematic District that could reduce the overall value of the remaining district. A total of 14 bridges are currently designated as County Landmarks as part of the Historic Bridges Thematic District, including the Maacama Creek Bridge. The Department of Public Infrastructure is currently in the process of rehabilitating or replacing bridges in the County that have been determined to be structurally obsolete and at risk of failure due to seismic and geologic hazards. Other existing or planned bridge projects include the following:

- Geysers Road over Big Sulphur Creek Bridge Replacement Project: The Geysers Road bridge over Big Sulphur Creek was replaced in 2025, however, the historic bridge remains in place. An Initial Study/Mitigated Negative Declaration was approved for this project in 2023.
- Watmaugh Road Bridge Replacement Project: The Watmaugh Road bridge over Sonoma Creek is planned for removal and replacement in 2026. The original bridge will be demolished; however, the original trusses will be retained and added to the new structure. An EIR was adopted for this project in 2012.
- Wohler Road Bridge Over the Russian River Seismic Retrofit Project: The Wohler Road bridge over the Russian River is currently undergoing seismic retrofitting. An Initial Study/Mitigated Negative Declaration was approved for this project in 2015.
- Bohemian Highway Bridge over Russian River Replacement Project: The Bohemian Highway bridge over the Russian River is being removed and replaced. An EIR for this project was adopted in 2022 and construction is anticipated to start in 2029.
- Lambert Bridge over Dry Creek: The Lambert Bridge over Dry Creek bridge rehabilitation project is currently in the planning phases.

The Geysers Road bridge project and Wohler Road bridge project were able to preserve the existing historic bridges, while the Watmaugh Road bridge project and Bohemian Highway bridge project require demolition, either partially or entirely, of the existing historic bridges. Future and past historic bridge replacement or rehabilitation projects are subject to the same requirements as the proposed Project and therefore must undergo review by the Landmarks Commission. In addition, all historic bridge projects require final review and approval by the County's Board of Supervisors on a case-by-case basis on the needs and merits of the individual project. In some cases, rehabilitation or retrofit of the historic bridge may be possible, however, in some cases, such as the proposed Project, it is not. While past County projects have been able to retain some historic bridges for non-vehicular travel purposes, as described in the EIR, retaining the Maacama Creek Bridge is not feasible due to the lack of space to construct a new

bridge in the same vicinity, the erosion issues associated with Maacama Creek, and the hazards the existing bridge poses to the public related to failure and collapse.

The loss of the Maacama Creek Bridge is individually considered to be a significant impact to a historical resource. Because of this, and because some of the other bridges in the Historic Bridge Thematic District have been removed (or may potentially be removed), the loss of the Chalk Hill Road bridge would represent a cumulatively considerable contribution to a significant impact on the Historic Bridge Thematic District. The HD district will remain in place to protect bridges that are being evaluated for retrofitting or replacement, and the County Landmarks Commission retains the authority to review all historic bridge projects. Nonetheless, the Project's contribution to a cumulative impact on historical resources within the Historic Bridge Thematic District would be considered significant and unavoidable.

Future projects and cumulative development in the region that involve ground-disturbing activities could encounter unknown archaeological resources and human remains. Per the County's General Plan, projects are required to contact the Northwest Information Center to determine if the project site may contain cultural resources. If a site is likely to have these resources, a field survey and preparation of an archaeological report shall be conducted. If potential for archaeological resources or human remains exists, projects would be required to implement mitigation measures similar to the ones being implemented for this Project. If human remains are found, projects are required to comply with the State of California Health and Safety Code Section 7050.5, as described in Mitigation Measure CUL-2. Therefore, the impact of the Project related to cumulative archaeological and human remains impacts would be less than cumulatively considerable.

ENERGY

The geographic scope for cumulative energy impacts is Sonoma County. The Project would not result in significant impacts related to energy consumption. The Project would require energy use for construction activities that would be similar to the energy used for comparable types of construction projects. The existing baseline for energy use is the existing bridge, which the Project would demolish and replace with a new bridge. Therefore, the impact of the Project related to energy use would be less than cumulatively considerable.

GEOLOGY AND SOILS

The geographic scope for cumulative geology and soils impacts is limited to the Project site and immediate vicinity. This scope is appropriate because geology and soils impacts, such as erosion and loss of topsoil, can affect adjacent sites but do not impact regional areas as a whole.

Population growth and development can gradually increase the number of people exposed to geologic hazards, including effects associated with seismic events such as ground shaking, landslides, and liquefaction. The Project would replace an existing bridge with a new bridge without increasing the roadway capacity; therefore, the Project would not contribute to or encourage population growth or development in the region. Therefore, the Project would not make a cumulatively considerable contribution to a significant cumulative impact related to seismic hazards.

Future development would also increase the potential for impacts to paleontological resources through construction activities in the area. There are no other existing or planned projects in the vicinity of the project site that would, when viewed in culmination with the proposed project,

result in a significant cumulative impact to paleontological resources. The Project would implement mitigation measures GEO-1 through GEO-6, as described in *Section 4.7, Geology and Soils*, to reduce potential impacts to paleontological resources to a less-than-significant level. Therefore, the impact of the Project related to geology and soils would be less than cumulatively considerable.

GREENHOUSE GAS EMISSIONS

The impact of a project's GHG emissions is inherently cumulative because GHG emissions from one project cannot, on their own, result in changes in climatic conditions. The emission from any one project must be considered in the context of their contribution to cumulative global emissions, which is the basis for determining a significant impact. The GHG emission baseline is that of the existing bridge, and the Project would not increase the amount of traffic or other GHG sources that could cumulatively contribute to increased GHG emissions. Therefore, the impact of the Project related to GHG emissions would be less than cumulatively considerable.

HAZARDS AND HAZARDOUS MATERIALS

The geographic scope for cumulative hazards and hazardous materials impacts is restricted to projects within 0.25 mile of the Project site. This scope is appropriate because the risks posed by hazards and hazardous materials are typically localized, with potential adverse effects from spills or releases decreasing significantly with distance from the source.

Development in the vicinity of any hazardous materials sites may increase the population exposed to the use and transport of hazardous materials; the routine use, storage, and disposal of hazardous materials; listed hazardous materials sites; and subject to emergency response and evacuation plans. However, the proposed Project would not facilitate cumulative development within the Project region. Furthermore, implementation of existing laws and regulations, including requirements for the storage, use, handling, and disposal of hazardous materials and remedial action for contaminated sites, would avoid potential hazard impacts associated with reasonably foreseeable future projects. In addition, since hazards and hazardous materials are required to be identified as part of the permit application and review process, potential impacts of future individual projects would be addressed prior to permit approval. Therefore, the impact of the Project related to hazards and hazardous materials would be less than cumulatively considerable.

HYDROLOGY AND WATER QUALITY

The geographic scope for cumulative hydrology and water quality impacts is the Russian River watershed and the Alexander Valley Groundwater Basin, in which the Project site is located. This scope is appropriate because water quality impacts are typically localized in the watershed where the impact occurs.

Construction of the proposed Project would be required to adhere to all applicable State and local regulations designed to control erosion and protect water quality, including the Sonoma County Code, the NPDES Construction General Permit, MS4 General Permits, and Sonoma County General Plan policies. As the Project site is greater than one acre, the construction contractor would be required to prepare and implement a SWPPP, further reducing the risk of water quality degradation on- and off-site from soil erosion and pollutant release during construction. Other past, present, and future projects in the watershed and groundwater basin would be subject to the same requirements for water quality protection. Therefore, construction of the Project would not result in a cumulatively considerable impact.

The Project would result in a minor increase of impermeable surface area, which would potentially increase peak flood flows, alter drainage patterns, and increase pollutants in stormwater runoff in the locality of the Project site. This minor increase in impermeable surface area would not significantly reduce groundwater recharge. The primary land use designation within the Russian watershed and Alexander Valley Groundwater Basin is Land Intensive Agriculture. Therefore, future projects within the geographic scope for hydrology and water quality impacts are not anticipated to result in large increases in impervious surface area, thus resulting in significant cumulative impacts related to flooding, stormwater runoff, or groundwater recharge. The impact of the proposed Project related to flooding, stormwater runoff, and groundwater recharge would be less than cumulatively considerable.

The Project would not result in a permanent increase in water demand, which in the region is primarily derived from local groundwater resources. Replacement of the existing bridge would not contribute to an increase in future development within the region. Therefore, the impact of the Project related to groundwater supply and water demand would be less than cumulatively considerable.

LAND USE

The geographic scope for cumulative land use impacts is the County of Sonoma, with a focus on unincorporated areas of the County. This scope is appropriate because the Project site is located in an unincorporated area of the County, and the County limits represent the planning area for the General Plan. As discussed in *Section 4.11, Land Use*, the proposed Project would not physically divide any established community. Therefore, the Project would not contribute to a significant cumulative impact related to community connectivity.

The Project would be consistent with applicable regional and local goals and policies. Any existing or future projects would be subject to regional and local regulations and would be reviewed for consistency with the General Plan and County Code of Ordinances. All future projects in the County would be required to adhere to applicable zoning and development regulations and general plan policies in place to mitigate environmental impacts where feasible. Therefore, each future project would be found consistent with applicable plans and policies prior to approval or would implement mitigation measures to comply with such requirements as feasible. As such, cumulative development in the County would not cause a significant environmental impact due to conflicts with local planning regulations. The impact of the Project related to consistency with local plans would be less than cumulatively considerable.

MINERAL RESOURCES

The geographic scope for cumulative mineral resources impacts is the County of Sonoma. The Project site does not contain any mapped mineral resources and would not involve mining or the acquisition of land where mining operations are occurring. The Project would have no impact on mineral resources; therefore, the impact of the Project related to mineral resources would be less than cumulatively considerable.

NOISE

The geographic scope for cumulative construction noise impacts is the Project site and immediate vicinity (i.e., residences surrounding the Project site). This scope is appropriate because construction noise impacts are generally localized and dissipate with increasing distance from the source. Multiple simultaneous construction projects in proximity can result in cumulative impacts if the combined construction noise exceeds applicable thresholds. As

described in *Section 4.13, Noise*, the proposed Project would not have a significant impact related to noise with the implementation of Mitigation Measures NOISE-1 and NOISE-2. There are no other construction projects planned within one mile of the Project site; therefore, construction of the Project would not contribute to a cumulatively considerable significant noise impact.

The Project would not increase traffic or facilitate cumulative development in the region. Further, operation of the Project is anticipated to decrease ambient noise levels in the vicinity because the new bridge would have a quiet deck that would reduce noise generated by vehicles traveling over the bridge. Therefore, operation of the Project would not contribute to a cumulatively considerable significant noise impact.

POPULATION AND HOUSING

The geographic scope for cumulative population and housing impacts is the County of Sonoma, specifically the unincorporated areas of the County. This scope is appropriate because housing development is planned on a regional basis by cities and counties. The Project would replace an existing bridge with a new bridge and would not increase travel lanes and thus increasing vehicle capacity. For this reason, the Project would not encourage future population growth in the region. The Project would not displace any housing or people, thus facilitating the need for housing elsewhere. Therefore, the impact of the Project related to population and housing would be less than cumulatively considerable.

PUBLIC SERVICES

The geographic scope for cumulative public services impacts is the service area of the services of the Project site. This geographic scope is appropriate because projects within the service area will increase the demand for these services. A cumulative impact would occur if growth in the service area requires physical expansion of facilities or the construction of new public facilities that would result in adverse physical impacts. The Project would not facilitate population growth because it would replace an existing bridge with a new bridge without increasing the capacity of transportation infrastructure. Therefore, the Project would not contribute to a cumulatively considerable significant impact on police protection services, fire protection services, schools, parks, or other public facilities.

RECREATION

The geographic scope for cumulative recreation impacts is the County of Sonoma. The Project would not impact any existing recreation facilities because there are none located in the vicinity of the Project site. The Project would not facilitate population growth that would increase the demand for recreation services, such that new facilities need to be built. Therefore, the Project would not contribute to a cumulatively considerable significant impact on recreational facilities.

TRANSPORTATION

The geographic scope for cumulative transportation impacts is the County of Sonoma. This scope is appropriate because transportation planning is conducted on a regional level through the County's General Plan. The Project would not increase population growth or expand the capacity of Chalk Hill Road; therefore, the Project would not result in any increase in VMT and would not contribute to a cumulatively considerable significant VMT impact. No other projects are proposed within two miles of the Project site; therefore, the Project would not contribute to a cumulatively considerable impact related to hazards from design features or incompatible uses.

The Project would not conflict with any emergency evacuation plans, and other future projects would be required to comply with applicable transportation regulations. Therefore, the impact of the Project related to transportation would be less than cumulatively considerable.

TRIBAL CULTURAL RESOURCES

The geographic scope for cumulative tribal cultural resources impacts is the Southern Pomo territory. This scope is appropriate because tribal cultural resources are determined by local tribes of the region. Cumulative development in the region would continue to disturb areas with potential to contain tribal cultural resources. Given the potential to damage unknown tribal cultural resources, cumulative impacts would be considered significant if no mitigation measures are implemented. Future projects will be reviewed separately and distinctly by local tribes under AB 52 and would be required to implement mitigation measures if the potential to impact tribal cultural resources is present. The proposed Project would implement mitigation measures to avoid any significant impacts to unknown cultural resources, including tribal cultural resources, that may be present within the Project site. The Project is not a growth-inducing project and would not facilitate buildout of the region beyond the existing conditions and what is accounted for in the County's General Plan. Therefore, the impact of the Project related to tribal cultural resources would be less than cumulatively considerable.

UTILITIES

The geographic scope for cumulative utilities impacts is the County of Sonoma. This scope is appropriate because impacts from solid waste disposal sites would be dispersed across various County disposal sites, and the service area for utility providers typically covers a larger region such as a portion of the County. The only utilities impacts resulting from the proposed Project would be temporary, as the Project would relocate the existing overhead utilities above the existing bridge to above the new bridge. No significant adverse effect would result from relocating the existing utilities. The Project would require some water supply for construction activities, which would be similar to the amount needed for other comparable types of construction projects. The Project would not result in an increased demand for water supply or wastewater collections services because the Project would not generate growth. The Project would generate waste from demolition of the existing bridge and general construction activities. However, projects in the County are required to recycle a certain proportion of construction and demolition waste, which other projects in the County would be required to comply with. Once the Project is operational, no increased generation of solid waste would occur. Therefore, the impact of the Project related to utilities would be less than cumulatively considerable.

WILDFIRE

The geographic scope for cumulative wildfire impacts is within two miles of the Project site. This geographic scope is appropriate because wildfires can cause impacts to large areas. Cumulative impacts related to wildfire would be significant if development in rural or high fire hazard areas could exacerbate wildfire risk or impact emergency evacuation. The Project would not result in a permanent increased wildfire risk and would not facilitate growth which would subject more people to wildfire hazards or increase the risk of wildfire ignition. There are no other projects within two miles of the site that are planned to undergo construction simultaneously with the proposed Project. Therefore, the impact of the Project related to wildfire would be less than cumulatively considerable.

6.0 OTHER CEQA CONSIDERATIONS

CEQA Guidelines section 15126.2(d) requires an EIR to include a discussion of the growth inducing impacts of a project. Growth inducement refers to the likelihood that the proposed project will foster growth in the surrounding area, either directly or indirectly. CEQA Guidelines section 15126.2(d) also requires a discussion of significant and irreversible changes that would be caused by the project if implemented.

6.1 Growth-Inducing Impacts

This section analyzes whether the proposed Project would directly or indirectly induce economic, population, or housing growth in the surrounding area. Transportation agencies play a role in land use changes by providing infrastructure that can improve mobility and/or open up access to new locations. New development generates travel to and from that location, which can in turn create demand for new transportation facilities.

The growth-inducing potential of a project would be significant if it were to foster growth or a concentration of population above what is assumed in local and regional land use plans. Significant growth-inducing impacts could also occur if a project were to provide infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

The proposed Project does not involve the expansion of existing urban service areas or the extension of infrastructure outside of existing urban service areas. Instead, it consists of the replacement of an existing bridge over Maacama Creek to meet the objectives described in *Section 2.0, Project Description*. The proposed Project does not include the construction of new housing that could directly induce population growth, nor does it include displacement of existing housing or people that would necessitate the construction of replacement housing elsewhere. No impacts to growth, population, or housing are anticipated as there are no proposed housing developments in the Project vicinity, nor are any anticipated in the near future. The Project is a highway improvement project that would not add vehicular capacity to Chalk Hill Road or alter its accessibility. Although one lane would be added to the bridge over Maacama Creek as compared to existing conditions, the roadway capacity on either side of the bridge would not change. The two-lane capacity of Chalk Hill Road would be maintained, and the Project would have no growth-inducing impacts in the area.

6.2 Significant Irreversible Changes

6.2.1 CEQA Requirements

The State CEQA Guidelines Section 15126.2(d) requires the evaluation and discussion in certain EIRs of significant irreversible changes that would be caused by a proposed project. State CEQA Guidelines Section 15127 (Limitations on Discussions of Environmental Impact) clarifies that this information concerning irreversible changes need only be included in EIRs prepared in connection with any of the following activities:

a) The adoption, amendment, or enactment of a plan, policy, or ordinance of a public agency;
b) The adoption by a Local Agency Formation Commission (LAFCO) of a resolution making determinations; or

c) A project which will be subject to the requirement for prepar4ing an environmental impact statement pursuant to the requirements of the National Environmental Policy Act (NEPA).

Implementation of the proposed Project would replace a narrow, collapse-susceptible bridge to improve safety and movement for vehicles, pedestrians, and bicyclists across Maacama Creek on Chalk Hill Road. The Project does not include any of the activities listed in CEQA Guidelines Section 15127 that would require the evaluation and discussion of significant irreversible environmental impacts. The Project is not a plan, policy, or ordinance; does not include LAFCO approvals; and does not require the preparation of a NEPA environmental impact statement. No further evaluation or documentation is required.

6.3 Significant Unavoidable Impacts

6.3.1 CEQA Requirements

A significant adverse unavoidable environmental impact is a significant adverse impact that cannot be reduced to a less than significant level through the implementation of mitigation measures. In some cases, adequate mitigation for a significant and unavoidable impact cannot be ensured because implementation of that mitigation is outside the jurisdiction of the lead agency. CEQA Guidelines section 15093 requires that a lead agency make findings of overriding considerations for unavoidable significant adverse environmental impacts before approving a project.

CEQA Guidelines section 15093(a) requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits of a project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable." CEQA Guidelines section 15093(b) states that when the lead agency approves a project which will result in the occurrence of significant effects which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record. The statement of overriding considerations shall be supported by substantial evidence in the record.

6.3.2 Significant and Unavoidable Impacts of the Proposed Project

The impacts of the proposed Project have been evaluated throughout the various sections of this EIR and are summarized in Table ES-1. The Project would have significant impacts with respect to Air Quality (exposing sensitive receptors to substantial pollutant concentrations), Biological Resources (potential adverse effect on special-status species, riparian habitat, and wildlife movement); Cultural Resources (substantial adverse change in the significance of a historical resource, potential substantial adverse change in the significance of an archaeological resource; potential to disturb human remains); Geology and Soils (potential destruction of paleontological resources); Hazards and Hazardous Materials (impair implementation of emergency response plan); Hydrology and Water Quality (potential to violate waste discharge requirements, result in substantial erosion/siltation, risk release of pollutants due to flooding); Noise (substantial temporary noise increase during construction); Transportation (inadequate emergency access); Tribal Cultural Resources (potential substantial adverse change in the significance of a tribal cultural resource); and Wildfire (impair emergency response and evacuation plans).

As discussed throughout the various impact analyses in this EIR, the proposed Project would be required to implement a series of mitigation measures to address the Project's significant adverse impacts within each of these environmental issue categories. With the implementation of these mitigation measures, which are also presented in Table ES-1, all but one of the Project's potentially significant impacts would be reduced to a less-than-significant level.

The Project would result in a significant and unavoidable impact to cultural resources by removing the existing Chalk Hill Road Bridge over Maacama Creek, which is a Sonoma County Local Historic Landmark and is part of the Sonoma County Historic Bridges Thematic District. For purposes of CEQA, projects included in a local register of historical resources are considered historical resources under CEQA. Therefore, the Chalk Hill Road Bridge is a historical resource under CEQA. Because the proposed Project would remove and replace an existing bridge that is designated as historically significant by Sonoma County, a ***significant unavoidable*** impact to historical resources is projected as a result of implementing the proposed Project. Therefore, the County will need to adopt a statement of overriding considerations in order to approve the Project.

7.0 ALTERNATIVES

7.1 CEQA Requirements

Section 15126.6(a) of the CEQA Guidelines states: "*An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparable merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.*"

Section 15126.6(b) of the CEQA Guidelines further requires that the analysis of alternatives focus on those alternatives capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of project objectives or would be more costly. Section 15126.6(d) states that the EIR must include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. If an alternative would cause one or more significant effects in addition to those that would be caused by the proposed project, these significant effects must be disclosed but may be discussed in less detail than the significant effects of the proposed project.

7.2 Project Objectives and Significant Effects

7.2.1 Project Objectives

The CEQA Guidelines require that alternatives must be able to meet most of the basic objectives of the project as well as avoid or substantially lessen any of the significant effects of the project. As described in *Section 2.0, Project Description,* objectives of the proposed Project are:

1. Ensure safe crossing for vehicles, bicyclists, and pedestrians along Chalk Hill Road over Maacama Creek by replacing or rehabilitating the existing bridge.
2. Satisfy the requirements of California's Local Bridge Seismic Retrofit Program to protect the traveling public from earthquake related hazards.
3. Satisfy the requirements of the Federal Highway Administration's Highway Bridge Program and ensure the project meets the civil, traffic, environmental, structural, and safety standards therein.

7.2.2 Significant Impacts of the Project

The proposed Project would result in significant and unavoidable impacts related to cultural resources. As described in *Section 4.5, Cultural Resources*, the Chalk Hill Road bridge over Maacama Creek is a County-designated historic landmark, is listed on the California Register, and is eligible for inclusion on the National Register. As such, demolition of the bridge as part of the proposed Project would represent a significant and unavoidable impact to cultural resources. All other significant Project impacts can be mitigated to a less-than-significant level via implementation of the mitigation measures listed throughout this EIR.

7.3 Alternatives Considered but Rejected

Section 15126.6(c) of the CEQA guidelines states: *"The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination...Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."*

In developing the Project, as part of the federal Section 4(f) impact evaluation process, the County considered several options for addressing the documented structural deficiencies of the existing Chalk Hill Road bridge over Maacama Creek. An alternative which consisted of rehabilitating the existing bridge without affecting the historic integrity of the structure was considered but ultimately rejected because it was found to be technically infeasible. Through the Section 4(f) impact study, the County determined this alternative to be technically infeasible because any rehabilitation strategy that retrofits the existing bridge structurally would adversely affect the integrity of the historic bridge (i.e., destroy the historic components of the bridge). In 1997, the County commissioned an engineering analysis to study what would be needed to ensure the existing bridge was seismically stable. That study was later updated in 2019 with more detailed information about the foundations for the south abutment. This alternative would implement the seismic retrofit strategy proposed by the County in 1997, along with new work to secure the large tuff block within the landslide debris that supports the south end of the bridge. To strengthen the bridge, thick concrete walls would be added to both sides of the main arches. Extra support would be provided by drilling deep shafts into the ground and connecting them with reinforced concrete beams. Prestressing would be installed at the base of the arches, anchoring them deep into the ground beneath the slide-prone area.

Additional support would be added between the arches using either concrete slabs or steel cross-bracing. The vertical columns above the arches would be replaced with stronger steel or concrete ones, and other structural parts of the bridge would be reinforced as needed. Damaged areas of the bridge deck would be repaired, and the side railings would be either fixed or rebuilt to ensure that no gaps are larger than four inches. At the south end, the large tuff block that supports part of the bridge would be stabilized with tiebacks. To protect the area from erosion and water damage, engineers would use a mix of soil nails, artificial rock covering, and rock armor near the creek.

This alternative was not favored by the public because it would remove or cover many of the bridge's historic features and reduce the amount of space under the bridge for stormwater to flow, which could increase erosion downstream. The County also rejected this alternative because it would require local funding that is not currently available and would be expensive to maintain over time. Therefore, this alternative was eliminated from further consideration.

7.4 Alternatives Considered

The following alternatives were selected to be evaluated in comparison to the proposed Project in this EIR:

- Alternative 1: No Project
- Alternative 2: Retain Existing Bridge

A description and analysis of each selected alternative is provided in the following sections.

7.4.1 Alternative 1: No Project

CEQA Guidelines section 15126.6 (e) requires that a "No Project" alternative be evaluated along with its impacts. The "No Project" alternative analysis must discuss the existing conditions, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

ALTERNATIVE 1 DESCRIPTION

Under the No Project Alternative (Alternative 1), the existing bridge would remain in place and no rehabilitation or replacement of the bridge would occur. Alternative 1 would result in the continued use of the existing bridge until the bridge potentially succumbs to collapse.

ALTERNATIVE 1 ATTAINMENT OF PROJECT OBJECTIVES

The No Project Alternative does not satisfy the Project objectives to ensure safe crossing for vehicles, bicyclists, and pedestrians along Chalk Hill Road over Maacama Creek. As described in *Section 2.0, Project Description,* the existing bridge is at risk of collapse from earthquakes and landslides, is scour critical, and has been deemed by Caltrans to be functionally obsolete. Therefore, an alternative which involves no rehabilitation or replacement of the existing bridge would not ensure safe crossing over Maacama Creek, would not satisfy the requirements of California's Local Bridge Seismic Retrofit Program or the Federal Highway Administration's Highway Bridge Program, and would not satisfy the Project objectives.

ALTERNATIVE 1 IMPACTS COMPARISON

Aesthetics

Under Alternative 1, a new bridge would not be built and the existing bridge would not be demolished; therefore, the existing aesthetics characteristics of the Project site would remain unchanged. Alternative 1 would have no impact on scenic vistas and no impact on the existing visual character or quality of public views of the site and its surroundings. Similar to the proposed Project, under this Alternative, there would be no impact to scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway. Under Alternative 1 there would be no new sources of light or glare on the site, and therefore this Alternative would result in no impact, as compared to the proposed Project's less than significant impact related to light and glare. While the proposed Project's aesthetic impacts would be less than significant, impacts to aesthetics under Alternative 1 would be less compared to the proposed Project.

Agriculture and Forest Resources

Under the No Project Alternative, no agricultural land, timberland, or forest land would be impacted. Whereas the proposed Project would have a temporary impact on farmland due to the need to use portions of agricultural parcels for construction staging areas, Alternative 1 would have no impact on farmland. Similar to the proposed Project, Alternative 1 would have no impact on forest land or timber land, because there is none present within the Project site. Alternative 1 would not result in any changes to the existing agricultural setting. Therefore, while the proposed Project's impacts related to agriculture would be less than significant, impacts

under the No Project Alternative would be less compared to the proposed Project.

Air Quality

The proposed Project would not conflict with or obstruct implementation of the NoSoCo Rules or policies of the Sonoma County General Plan relating to air quality. The NoSoCo Air District is currently in attainment for each of the criteria pollutants; therefore, the proposed Project would not result in an increase in pollutant emissions for which the region is in nonattainment. The proposed Project would implement Mitigation Measure AIR-1 to reduce impacts associated with fugitive dust to a less-than-significant level. The proposed Project would generate TAC emissions during construction which would potentially impact sensitive receptors (residents) near the Project site. The Project would implement Mitigation Measure AIR-2 to reduce these impacts to a less-than-significant level. In addition, construction activities under the proposed Project would generate some odors due to the use of gasoline- and diesel-fueled equipment on-site; however, these impacts would be less than significant. Under Alternative 1, no construction activities would occur on-site; therefore, no emissions would be generated, and no mitigation measures would be required. Whereas the impact of the proposed Project related to air quality would be less than significant with mitigation incorporated, Alternative 1 would have no impact on air quality. Therefore, the impact of Alternative 1 would be less than the proposed Project.

Biological Resources

Because no construction or demolition work would occur under Alternative 1, no grading, excavation, or development would occur and no trees or vegetation would be removed from the Project site. The proposed Project would result in less-than-significant impacts to biological resources with the implementation of mitigation measures discussed in *Section 4.4, Biological Resources*. Mitigation measures are required to reduce impacts of the proposed Project related to special-status species, sensitive natural communities, and fish corridors. The No Project Alternative would not involve construction activities; therefore, no changes to the biological resources on-site would result from Alternative 1. However, under Alternative 1, the erosion occurring at the base of the existing bridge would continue, which would result in increased sedimentation in Maacama Creek. Furthermore, if the existing bridge were to collapse at some point in the future, individual special status species and their habitats could be directly impacted, which would be a potentially significant and unavoidable impact. The proposed Project is anticipated to result in a long-term benefit to habitat within Maacama Creek due to Project design features. Specifically, the native plantings are expected to improve riparian cover as they mature, and the placement of log rootwads would provide refugia for migrating and rearing salmonids and create scour pools that can provide additional habitat for juvenile salmonids. Therefore, while the proposed Project's significant biological resources impacts can be mitigated to less-than-significant levels, short-term impacts to biological resources under Alternative 1 would be less compared to the proposed Project. However, potential long-term impacts of Alternative 1 may result in direct and indirect impacts to special-status species and their habitat, which would be more severe than the temporary impacts of the proposed Project.

Cultural Resources

The proposed Project would include demolition of the existing Chalk Hill Road bridge over Maacama Creek, which is a Sonoma County Landmark and is eligible for inclusion on the National Register. This is a significant environmental impact that has no viable mitigation measures which could reduce the impact to a less-than-significant level. During construction, the

Project also has the potential to impact unknown archaeological resources and human remains which may be present within the Project site. The proposed Project would implement Mitigation Measure CUL-1 and CUL-2 which contain measures to follow in the event that an archaeological resource or human remains are found during construction. The implementation of these measures would reduce the impact of the Project related to archaeological resources and human remains to a less-than-significant level. Under Alternative 1, the existing historic bridge would remain in place and no construction would occur on-site. However, if the existing bridge were to collapse at some point in the future, the historic resource would be lost, which would be a potentially significant and unavoidable impact. Therefore, Alternative 1 would avoid the Project's known and direct significant and unavoidable impact to historical resources and would have no impact on archaeological resources and human remains. The impact of Alternative 1 would be less than the proposed Project.

Energy

The proposed Project would require the use of energy to construct the new bridge and demolish the existing bridge. This impact would be similar to the energy needed for other similar projects within the County and would not result in a long-term increase in energy use. Therefore, the impact of the proposed Project related to energy would be less than significant. The No Project Alternative would not result in any change in the use of energy and would not increase any energy demand. Therefore, the impact of Alternative 1 would be less than the proposed Project.

Geology and Soils

The Project site is not located near a known earthquake fault; therefore, no impact related to fault rupture would occur under the proposed Project or under Alternative 1. Due to its location in a seismically active region, the Project site would be subject to ground shaking and related hazards under both Alternative 1 and the proposed Project. However, the proposed Project would construct a new bridge that is compliant with the requirements of California's Local Bridge Seismic Retrofit Program and Caltrans Seismic Design Criteria, which would reduce hazards associated with seismic activity as compared to existing conditions. Under Alternative 1, the existing bridge, which is at risk of collapse from earthquakes and landslides, would remain in place, which is a public hazard. This would represent a significant and unavoidable impact. Therefore, impacts related to seismic hazards would be less under the proposed Project than under Alternative 1.

Construction activities under the proposed Project would result in loose and disturbed soils which could result in soil erosion and loss of topsoil. However, the Project would implement a SWPPP and implement Mitigation Measure HYDRO-1 to control erosion and sediment in stormwater runoff. Under Alternative 1, no construction activities would occur, so no soil erosion would occur due to earth-disturbing activities. Therefore, the short-term impact of Alternative 1 related to soil erosion would be less than the proposed Project. However, the proposed Project would implement scour countermeasure and streambank stabilization measures along the sides of Maacama Creek, which would result in a long-term reduction of erosion and sedimentation of the creek. Under Alternative 1, the existing erosion conditions on-site would continue to be exacerbated by wind and water, which would result in a more prominent erosion impact than the proposed Project, over the long-term. Therefore, impacts related to soil erosion would be less under the proposed Project than under Alternative 1.

Since no grading or ground-disturbing activities would take place under Alternative 1, no impact to paleontological resources could occur during excavation, as compared to the proposed

Project's less than significant impact with mitigation incorporated. Therefore, impacts related to paleontological resources would be less under Alternative 1 than under the proposed Project.

Greenhouse Gas Emissions

Construction activities under the proposed Project would result in a short-term increase in GHG emissions. This short-term increase would not conflict with conflict with any GHG reduction plan or any adopted thresholds for GHG emissions. The proposed Project would not result in any change to long-term GHG emissions, as the Project would not increase traffic or change the vehicle fleet in the area. Under Alternative 1, no construction activities would occur, therefore, no change in GHG emissions would occur. As such, impacts related to GHG would be less under Alternative 1 than under the proposed Project.

Hazards and Hazardous Materials

Construction activities under the proposed Project would require the use of construction equipment and machinery that would necessitate the transport, use, storage, and disposal of hazardous materials such as oils, grease, lubricants, and solvents. The materials would be handled in accordance with all applicable regulations and would not create a significant hazard to the public or the environment. Construction of the Project could also cause temporary delays to emergency vehicles passing through the Project site, but this impact would be mitigated to a less-than-significant level with implementation of Mitigation Measure TRAN-1. Under Alternative 1, no construction activities would occur; therefore, no impact related to hazardous materials or emergency vehicles would occur. By leaving the existing bridge in place and in public use, Alternative 1 could potentially, at some future point in time, result in the release of hazardous materials into Maacama Creek if the bridge were to become unstable and collapse. While the short-term impact of Alternative 1 would be less than the proposed Project, this potential long-term impact would be greater.

Hydrology and Water Quality

Construction activities under the proposed Project would have the potential to impact water quality. The Project would include grading and excavation work that would increase the risk of soil erosion and result in stormwater runoff carrying loose sediments into nearby waterways. Furthermore, construction would require the use of hazardous materials and pollutants, such as diesel, gasoline, lubricants, and other products, which may also be captured in stormwater runoff if not handled properly on-site. The proposed Project would implement Mitigation Measure HYDRO-1 to reduce these potential impacts to a less-than-significant level. The proposed Project would have no impact related to groundwater recharge or supply and would have a less-than-significant impact related to drainage patterns. Under Alternative 1, no short-term impact to water quality, groundwater supply, or drainage patterns would occur because no construction activities would occur. Therefore, the short-term impact of Alternative 1 would be less than the proposed Project.

The proposed Project is anticipated to result in a long-term beneficial impact to water quality because it would resolve scour issues associated with the existing bridge and implement streambank stabilization measures along areas of the creek that are prone to erosion. Under Alternative 1, the existing erosion and scour issues on-site would continue to be exacerbated over time, resulting in increased sedimentation of Maacama Creek. Furthermore, if the existing bridge were to collapse at some point in the future, a significant impact to water quality would occur due to the bridge materials and sediment being deposited into the creek. Therefore,

Alternative 1 would result in more significant long-term water quality impacts than the proposed Project.

Land Use

The proposed Project is subject to requirements of the Sonoma County Zoning Code. The proposed Project is within the HD, SR, OAK, VOH, RC, and Z combining zoning districts, and is subject to the requirements of these ordinances. Although County public works projects are exempt from certain portions of the zoning code, such as those regulations applying to tree removal, the Project would replace all removed trees as part of the revegetation efforts. The Project would also comply with requirements of the HD district and SR district by undergoing review by the County Landmarks Commission and administrative design review. While the land use impacts resulting from the proposed Project would be less than significant, Alternative 1 would have no impact related to land use because no construction would occur and the land use of the Project site would remain the same. The impact of Alternative 1 would be less than the proposed Project.

Mineral Resources

There are no mineral resources within the Project site; therefore, the proposed Project and Alternative 1 would have no impact on mineral resources. The impact of Alternative 1 would be the same as the proposed Project.

Noise

Construction of the proposed Project would generate noise that would result in a temporary increase in ambient noise levels in the Project area. The Project would implement Mitigation Measures NOISE-1 and NOISE-2 to reduce potential impacts to a less-than-significant level. The proposed Project would result in a less-than-significant impact related to vibration. The Project would not increase vehicular traffic, and the new bridge would have a quiet deck which would reduce noise associated with vehicles traveling over the bridge. Under Alternative 1, no construction would occur on-site; therefore, no increase in noise or vibration would occur within the Project area. The Project site is not located in the vicinity of a private airstrip or airport land use plan; therefore, no noise impact related to aircrafts or airports would occur under the proposed project or Alternative 1. Whereas the impact of the proposed Project related to noise would be less than significant with mitigation incorporated, Alternative 1 would have no noise impact. The impact of Alternative 1 would be less than the proposed Project.

Population and Housing

The proposed Project would not result in any expansion of bridge capacity and would therefore not induce any substantial population growth. The No Project Alternative would not result in any changes to existing conditions on-site; therefore, no impact related to displacement or population growth would occur. The impact of Alternative 1 would be the same as the proposed Project.

Public Services

The proposed Project would have no impact on public services such as schools, libraries, and recreational facilities. During construction, the proposed Project may temporarily delay police, fire, and emergency medical services crossing through the Project site. These impacts would be temporary and would not be significant. No impact related to public services would occur under

Alternative 1 because no construction work would occur and the on-site conditions would remain the same. Therefore, the impact of Alternative 1 would be less than the proposed Project.

Recreation

There are no recreational facilities within the vicinity of the Project site. The proposed Project would not impact any recreational facilities and would not result in population growth that would require the construction of new recreational facilities. Under Alternative 1, no new bridge would be built, and the existing bridge would remain in use. No impact to recreational facilities would occur under Alternative 1. The impact would be the same as the proposed Project.

Transportation

Construction of the proposed Project would have temporary impacts to transportation facilities in order to build the new bridge and approach roadways. The Project has been designed to keep the existing bridge open to traffic while the new bridge is being constructed, which would avoid impacts associated with detouring traffic. Safety precautions would be taken during on-site construction work to avoid any transportation-related hazards, such as reflective signs, changeable message boards, cones, and barricades. The Project would also implement Mitigation Measure TRAN-1, which requires the construction contactor to notify emergency service providers of the construction schedule and potential for delays. The Project would not have any impact on VMT because the Project would not increase the roadway capacity or encourage growth within the Project area. Therefore, impacts of the proposed Project related to transportation would be less than significant with mitigation incorporated.

Under Alternative 1, the existing bridge would remain in place and no new bridge would be built. Therefore, no short-term impacts from construction work would occur under Alternative 1. However, the existing bridge is a hazard to the public because it is scour critical and at risk of collapse from earthquakes and landslides. As such, leaving the existing bridge in place presents a transportation-related hazard that would be avoided by implementing the proposed Project. Additionally, the potential loss of the bridge at some future time under Alternative 1 would result in a lengthy period of travel disruption in this portion of the County, inconveniencing local residents and creating gaps in the provision of emergency services. Therefore, long-term impacts of the proposed Project related to transportation hazards would be less than under Alternative 1.

Tribal Cultural Resources

The proposed Project has the potential to impact unknown archaeological resources, which may be tribal cultural resources, during Project construction. The Project would implement mitigation measures in case of an accidental discovery of buried archaeological resources, which would reduce the impact to a less-than-significant level. Under Alternative 1, no construction work would occur on-site; therefore, there is no potential for tribal cultural resources to be impacted. The impact under Alternative 1 would be less than the proposed Project.

Utilities

The proposed Project would have a less-than-significant impact related to utilities. The proposed Project would relocate utility infrastructure on the existing bridge, including electrical lines and telecommunications lines, to the proposed new bridge. These facilities would be relocated within the Project site and would not cause significant environmental effects. The proposed Project would not result in an increased demand for water or wastewater service and would not generate solid waste in excess of state or local standards. The proposed Project

would comply with all management and reduction statutes related to solid waste. Under Alternative 1, no utilities would be relocated, no increases in demand for water or wastewater would occur, and no solid waste would be generated. The exiting utilities on-site would remain unchanged. Therefore, the impact of Alternative 1 would be less than the proposed Project.

Wildfire

The proposed Project would have a less-than-significant impact related to wildfire. The proposed Project would not impair any emergency response or evacuation plans. Construction activities on-site would temporarily increase hazards related to wildfire as there is potential for equipment to create sparks which could ignite nearby vegetation. However, the Project would follow all relevant policies and regulations relating to equipment use and construction safety, which would ensure that any ignition would be extinguished swiftly. The Project would not expose any people or structures to risks associated with post-fire hazards, such as downstream flooding or landslides. Although the proposed Project would alter local drainage patterns, it would not change the topography in a way that would present exacerbated risks to people within the Project vicinity. Once the Project is constructed, the wildfire risk would be similar to existing conditions on-site. Under Alternative 1, no construction activities would occur on-site, and the existing bridge would remain in place. Therefore, Alternative 1 would not present any increased risk of wildfire; the impact would be less than the proposed Project.

7.4.2 Alternative 2: Retain Existing Bridge

In order to satisfy CEQA requirements of evaluating an alternative which would avoid significant impacts resulting from the proposed Project, an alternative in which the existing historic bridge would remain intact is being evaluated in this EIR. The Retain Existing Bridge Alternative (Alternative 2) assumes that a new replacement bridge would be constructed next to the existing bridge; however, the existing bridge would remain in place and would not be demolished.

ALTERNATIVE 2 DESCRIPTION

There are two common methods for building a new bridge at a different location without causing adverse effects to the existing historic bridge: building a parallel bridge and using the new bridge and old bridge as a “couplet” of two one-way bridges; and building a new bridge at a different location and leaving the historic bridge in place for non-vehicular uses.

The “couplet” alternative has been used throughout California and the rest of the United States, sometimes as a preservation alternative but more often as an economic measure, when the older bridge is in sound condition and has a useful life.

Numerous environmental and social concerns would require that the new bridge be built very close to the existing Chalk Hill Road bridge. Environmental constraints include avoiding old growth oak trees, chiefly on the south bank of Maacama Creek. Social concerns include avoiding taking any residences or using valuable farmland, including vineyards. The new bridge and old bridge would need to be located quite close to each other on both the north and south sides of the creek, making traffic merges problematic.

ALTERNATIVE 2 ATTAINMENT OF PROJECT OBJECTIVES

Alternative 2 does not meet the first Project objective of providing safe crossing over Maacama Creek because the existing bridge cannot be used safely for vehicular traffic due to its instability. In order to continue to use the historic bridge for vehicular traffic, it would need to be

seismically stabilized. As discussed in *Section 7.3, Alternative Considered but Rejected,* any continued vehicular use of the existing bridge requires at a minimum a major seismic retrofit to ensure the bridge would withstand an earthquake. The work would be so extensive as to constitute an adverse effect on the historic integrity of the bridge. It is also not clear, however, that the seismic retrofit would fully resolve structural deficiencies, especially those associated with the unstable foundations.

All arguments that work against the couplet alternative work against leaving the historic bridge in place for non-vehicular purposes. Leaving the bridge in place for pedestrian and bicycle uses would not require the same degree of retrofit as would be required for continued vehicular uses; however, any retrofit in addition to work needed to stabilize the south foundations would still result in an adverse effect on the historic bridge.

An additional concern for this alternative is the fact that the new bridge would be downstream from the historic bridge due to the existing structures located upstream along the creek. Maacama Creek is an uncontrolled stream and winter flooding is now common. Experience and common sense argue against building a new bridge downstream from an unstable bridge on a flood-prone waterway.

The setting for the historic bridge would be compromised by the fact that the new structure would be located less than 100 feet from the old bridge on the south side of the creek and nearly touching the old structure on the north side. This proximity also argues against the utility of the bypassed bridge in terms of non-vehicular users. The rural roads of Sonoma County are used widely by bicyclists. The awkward connections between the new and old alignments suggest that bicyclists may choose simply to remain on the new Chalk Hill Road alignment rather than getting off to use the short, bypassed section, then remerging with Chalk Hill Road.

For the reasons described above, while Alternative 2 could theoretically fulfill Project objectives 2 and 3 by building a new bridge that complies with California's Local Bridge Seismic Retrofit Program and the Federal Highway Administration's Highway Bridge Program requirements, this Alternative would not fulfill the first Project objective of providing safe crossing over Maacama Creek for vehicles, bicyclists, and pedestrians. Leaving the existing bridge in place presents a whole new host of safety concerns and hazards which would represent a significant and unavoidable hazards impact.

ALTERNATIVE 2 IMPACTS COMPARISON

This analysis identifies potential impacts associated with the Retain Existing Bridge Alternative and compares them with the impacts of the proposed Project. The environmental effects of this alternative as compared to the proposed Project are summarized by topic area below.

Aesthetics

The proposed Project would have a less-than-significant impact related to aesthetics. The proposed new bridge would be designed to avoid contrasting elements to the existing landscape and would be similar in massing to the existing bridge. Under Alternative 2, the existing bridge would remain in place and a new bridge would be built next to it. This would result in an increased structural mass on the project site, which is less similar to the baseline environmental conditions than would result from the proposed Project. Similar to the proposed Project, Alternative 2 would not impact any scenic resources within a State scenic highway. Alternative 2 would have similar impacts related to light and glare as compared to the proposed Project. Therefore, due to the increased mass of structures on the Project site under Alternative 2, the

impact to aesthetics would be less under the proposed Project than under Alternative 2.

Agriculture

The proposed Project would have a less-than-significant impact on agricultural resources. The proposed Project and Alternative 2 would have a temporary impact on farmland due to the need to use portions of agricultural parcels for construction staging areas. Similar to the proposed Project, Alternative 2 would have no impact on forest land or timber land, because there is none present within the Project site. Therefore, the impact of Alternative 2 related to agriculture would be the same as the proposed Project.

Air Quality

The proposed Project would not conflict with or obstruct implementation of the NoSoCo Rules or policies of the Sonoma County General Plan relating to air quality. The NoSoCo Air District is currently in attainment for each of the criteria pollutants; therefore, the proposed Project would not result in an increase in pollutant emissions for which the region is in nonattainment. The proposed Project would implement Mitigation Measure AIR-1 to reduce impacts associated with fugitive dust to a less-than-significant level. The proposed Project would generate TAC emissions during construction which would potentially impact sensitive receptors (residents) near the Project site. The Project would implement Mitigation Measure AIR-2 to reduce these impacts to a less-than-significant level. In addition, construction activities under the proposed Project would generate some odors due to the use of gasoline- and diesel-fueled equipment on-site; however, these impacts would be less than significant. Under Alternative 2, construction activities to build the new bridge would generate emissions which could impact sensitive receptors near the Project site. As such, Mitigation Measures AIR-1 and AIR-2 would still apply to Alternative 2. However, because Alternative 2 would retain the existing bridge, the overall amount of emissions generated would be less than the proposed Project because the overall amount of construction work on-site would be less. Therefore, the impact of the proposed Project and Alternative 2 related to air quality would be less than significant with mitigation incorporated; however, the overall impact of Alternative 2 would be less than the proposed Project.

Biological Resources

Construction of the proposed Project would cause potentially significant impacts to special-status wildlife species, including hoary bat, California giant salamander, NPT, FYLF, red-bellied newt, Russian River tule perch, CC chinook salmon, CCC coho salmon, and CCC steelhead. As described in *Section 4.4, Biological Resources*, the Project would implement Mitigation Measures BIO-1 through BIO-5 to reduce potential impacts to special-status wildlife species to a less-than-significant level. Because Alternative 2 would include construction activities to build the new bridge, this alternative would also have a potentially significant impact on special-status wildlife species and would be required to implement the same mitigation measures as the proposed Project to reduce impacts associated with construction to a less-than-significant level. Therefore, the impact of Alternative 2 to special-status species would be the same as the proposed Project.

Both the proposed Project and Alternative 2 would result in temporary and permanent impacts to sensitive natural communities. Temporary impacts would occur where natural communities would be disturbed by construction activities but would be restored and revegetated following Project construction. Permanent impacts would be incurred from construction of the new bridge and its support structures, and construction of the new approach roadways. Both the proposed

Project and Alternative 2 would be required to implement Mitigation Measure BIO-6 and BIO-7, which require protection measures for Maacama Creek to be implemented during construction, and a RHRP be prepared by a qualified restoration ecologist or biologist and be implemented following construction. Because Alternative 2 would not demolish the existing bridge, the overall impact of construction activities would be less than under the proposed Project, however, the impact to sensitive natural communities would remain less than significant with mitigation incorporated.

The proposed Project is anticipated to result in a long-term beneficial impact to Maacama Creek because it would eliminate the scour issues associated with the existing bridge, which are contributing to sedimentation of the creek. Under Alternative 2, the existing bridge would be retained; therefore, the erosion occurring at the base of the existing bridge would continue, further exacerbating sedimentation of Maacama Creek in the long-term. In addition, Alternative 2 would approximately double the area of shading over Maacama Creek by retaining the existing bridge and constructing a new bridge. If the existing bridge were to collapse at some point in the future, individual special status species and their habitats could be directly impacted, which would be a potentially significant and unavoidable impact. Therefore, while Alternative 2 would have a less significant short-term impact to sensitive natural communities, the long-term impact of the proposed Project would be less than Alternative 2.

Both the proposed Project and Alternative 2 would result in temporary impacts to wildlife movement corridors, as construction work within Maacama Creek would require the use of a stream diversion system. All construction work would occur during the dry season, and the creek bed would be regraded to its natural contours once the stream diversion system is removed. Both the proposed Project and Alternative 2 would be required to implement Mitigation Measure BIO-4, which requires a fish capture and relocation plan to be implemented to move fish and other aquatic life outside of the Project area before the stream diversion system is installed. This measure would reduce impacts associated with wildlife movement corridors to a less-than-significant level. However, because Alternative 2 would only require one construction season rather than the two needed for the proposed Project, the impact of Alternative 2 related to wildlife movement corridors would be less than the proposed Project but would remain less than significant with mitigation incorporated.

Both the proposed Project and Alternative 2 would be subject to the requirements of the Sonoma County General Plan and Zoning Code. As discussed above, the proposed Project and Alternative 2 would implement mitigation measures to ensure the protection of special-status wildlife, sensitive natural communities, aquatic resources, and wildlife movement corridors. With implementation of these measures, neither the proposed Project nor Alternative 2 would conflict with policies of the General Plan. Both the proposed Project and Alternative 2 would require the removal of trees, some of which may be protected under the County's Tree Protection Ordinance. However, the Tree Protection Ordinance does not apply to County public works projects; furthermore, the proposed Project and Alternative 2 would replace all trees removed by the Project in kind. Therefore, the impact of the proposed Project and Alternative 2 related to conflicts with policies protecting biological resources would be less than significant with mitigation incorporated. The impact of Alternative 2 would be the same as the proposed Project.

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved habitat conservation plans in the project area. Neither the proposed Project nor Alternative 2 would have an impact on any such plans. The impact of Alternative 2 would be the same as the proposed Project.

Cultural Resources

The proposed Project would include demolition of the existing Chalk Hill Road bridge over Maacama Creek, which is a Sonoma County Landmark and is eligible for inclusion on the National Register. This is a significant environmental impact that has no viable mitigation measures which could reduce the impact to a less-than-significant level. During construction, the Project also has the potential to impact unknown archaeological resources and human remains which may be present within the Project site. The proposed Project would implement Mitigation Measure CUL-1 and CUL-2 which contain measures to take in the event that an archaeological resource or human remains are found during construction. The implementation of these measures would reduce the impact of the Project related to archaeological resources and human remains to a less-than-significant level. Under Alternative 2, the existing historic bridge would remain in place unaltered, and a new bridge would be built for all vehicle, bicycle, and pedestrian travel purposes. However, leaving the existing bridge in place unaltered leaves it susceptible to failure from seismic activity or scour; therefore, it is anticipated that the existing bridge would collapse in the future. Therefore, Alternative 2 would avoid the Project's known and direct significant and unavoidable impact to historical resources and would have no impact on archaeological resources and human remains. The impact of Alternative 1 would be less than the proposed Project.

Energy

The proposed Project would require the use of energy to construct the new bridge and demolish the existing bridge. This impact would be similar to the energy needed for other similar projects within the County and would not result in a long-term increase in energy use. Therefore, the impact of the proposed Project related to energy would be less than significant. Under Alternative 2, the existing bridge would not be demolished; therefore, less energy would be used overall during construction. Therefore, impact of Alternative 2 would be less than the proposed Project.

Geology and Soils

The Project site is not located near a known earthquake fault; therefore, no impact related to fault rupture would occur under the proposed Project or under Alternative 2. Due to its location in a seismically active region, the Project site would be subject to ground shaking and related hazards under both Alternative 2 and the proposed Project. However, the proposed Project would construct a new bridge that is compliant with the requirements of California's Local Bridge Seismic Retrofit Program and Caltrans Seismic Design Criteria, which would reduce hazards associated with seismic activity as compared to existing conditions. Under Alternative 2, a new seismically resilient bridge would still be built for vehicle, bicycle, and pedestrian travel. However, whereas the proposed Project would demolish the existing bridge, which is at risk of collapse from earthquakes and landslides, Alternative 2 would retain the bridge, which presents a public hazard. This would represent a significant and unavoidable impact given the potential for collapse of the existing bridge to damage or destroy the new bridge adjacent to it on the downstream side. Therefore, impacts related to seismic hazards would be less under the proposed Project than under Alternative 2.

Construction activities under the proposed Project would result in loose and disturbed soils which could result in soil erosion and loss of topsoil. However, the Project would implement a SWPPP and implement Mitigation Measure HYDRO-1 to control erosion and sediment in stormwater runoff. Alternative 2 would also require grading and excavation work on-site, which would result

in loose and disturbed soils. Alternative 2 would also be required to implement a SWPPP and Mitigation Measure HYDRO-1 to reduce potential impacts of soil erosion and loss of topsoil to a less-than-significant level. Therefore, the short-term impact of Alternative 2 related to soil erosion would be the same as the proposed Project. However, the proposed Project would eliminate scour issues associated with the existing bridge by demolishing the bridge, whereas Alternative 2 would retain the bridge, further exacerbating scour issues. As such, the proposed Project would reduce erosion and sedimentation of Maacama Creek in the long-term, while Alternative 2 would continue to exacerbate these issues. Therefore, impacts related to soil erosion would be less under the proposed Project than under Alternative 2.

As described above, Alternative 2 would require grading and excavation work that could potentially impact unknown paleontological resources within the Project site. Therefore, Mitigation Measures GEO-1, GEO-2, GEO-3, GEO-4, GEO-5, and GEO-6 would still apply to Alternative 2. With implementation of these mitigation measures, potential impacts to paleontological resources under Alternative 2 would be reduced to a less-than-significant level. Therefore, impacts related to paleontological resources would be the same under Alternative 2 as under the proposed Project.

Greenhouse Gas Emissions

Construction activities under the proposed Project would result in a short-term increase in GHG emissions. This short-term increase would not conflict with conflict with any GHG reduction plan or any adopted thresholds for GHG emissions. The proposed Project would not result in any change to long-term GHG emissions, as the Project would not increase traffic or change the vehicle fleet in the area. Under Alternative 2, GHG emissions associated with construction would be less than the proposed Project, because no demolition of the existing bridge would be included. Therefore, impacts related to GHG would be less under Alternative 2 than under the proposed Project.

Hazards and Hazardous Materials

Construction activities under the proposed Project would require the use of construction equipment and machinery that would necessitate the transport, use, storage, and disposal of hazardous materials such as oils, grease, lubricants, and solvents. The materials would be handled in accordance with all applicable regulations and would not create a significant hazard to the public or the environment. Construction of the Project could also cause temporary delays to emergency vehicles passing through the Project site, but this impact would be mitigated to a less-than-significant level with implementation of Mitigation Measure TRAN-1. Alternative 2 would also require the use of hazardous materials during construction, and the same regulations for handling, storage, use, and transport would apply. Alternative 2 could also cause temporary delays to emergency vehicles passing through the Project site, so Mitigation Measure TRAN-1 would still apply. Therefore, the impact of Alternative 2 related to hazards and hazardous materials would be the same as the proposed Project.

Hydrology and Water Quality

Construction activities under the proposed Project would have the potential to impact water quality. The Project would include grading and excavation work that would increase the risk of soil erosion and result in stormwater runoff carrying loose sediments into nearby waterways. Furthermore, construction would require the use of hazardous materials and pollutants, such as diesel, gasoline, lubricants, and other products, which may also be captured in stormwater

runoff if not handled properly on-site. The proposed Project would implement Mitigation Measure HYDRO-1 to reduce these potential impacts to a less-than-significant level. The proposed Project would have no impact related to groundwater recharge or supply and would have a less-than-significant impact related to drainage patterns. Under Alternative 2, similar short-term water quality impacts would occur due to construction activities, and Mitigation Measure HYDRO-1 would still apply. Therefore, the short-term impact of Alternative 2 would be less than the proposed Project.

The proposed Project is anticipated to result in a long-term beneficial impact to water quality because it would resolve scour issues associated with the existing bridge and implement streambank stabilization measures along areas of the creek that are prone to erosion. Under Alternative 2, the existing scour conditions along the historic bridge would continue to be exacerbated over time, resulting in increased sedimentation of Maacama Creek. Therefore, Alternative 2 would result in more significant long-term water quality impacts than the proposed Project.

Land Use

The proposed Project is subject to requirements of the Sonoma County Zoning Code. The proposed Project is within the HD, SR, OAK, VOH, RC, and Z combining zoning districts, and is subject to the requirements of these ordinances. Although County public works projects are exempt from certain portions of the zoning code, such as those regulations applying to tree removal, the Project would replace all removed trees as part of the revegetation efforts. The Project would also comply with requirements of the HD district and SR district by undergoing review by the County Landmarks Commission and administrative design review. Alternative 2 would also involve construction work that would be subject to the same local regulations. Therefore, Alternative 2 would have similar impacts to land use as the proposed Project. The impact of Alternative 2 would be the same as the proposed Project and would remain less than significant.

Mineral Resources

There are no mineral resources within the Project site; therefore, the proposed Project and Alternative 2 would have no impact on mineral resources. The impact of Alternative 2 would be the same as the proposed Project.

Noise

Construction of the proposed Project would generate noise that would result in a temporary increase in ambient noise levels in the Project area. The Project would implement Mitigation Measures NOISE-1 and NOISE-2 to reduce potential impacts to a less-than-significant level. The proposed Project would result in a less-than-significant impact related to vibration. The Project would not increase vehicular traffic, and the new bridge would have a quiet deck which would reduce noise associated with vehicles traveling over the bridge. Under Alternative 2, the same construction activities would occur on-site to build the new bridge, but the existing bridge would not be demolished. Alternative 2 would generate similar amounts of noise as the proposed Project during the bridge construction period and would implement Mitigation Measures NOISE-1 and NOISE-2 to reduce the construction noise impacts to a less-than-significant level. However, because Alternative 2 would not demolish the existing bridge, the temporary noise impacts would be less than the proposed Project because less overall construction work would occur. The Project site is not located in the vicinity of a private airstrip or airport land use plan; therefore,

no noise impact related to aircraft or airports would occur under the proposed Project or Alternative 2. Whereas the impact of the proposed Project and Alternative 2 related to noise would be less than significant with mitigation incorporated, Alternative 2 would generate less overall noise during Project construction. Therefore, the impact of Alternative 2 would be less than the proposed Project.

Public Services

The proposed Project would have no impact on public services such as schools, libraries, and recreational facilities. During construction, the proposed Project may temporarily delay police, fire, and emergency medical services crossing through the Project site. These impacts would be temporary and would not be significant. Under Alternative 2, construction work may also temporarily delay police, fire, and emergency medical services crossing through the Project site. However, similar to the proposed Project, these impacts would be temporary and would be less than significant. Therefore, the impact of Alternative 2 would be the same as the proposed Project.

Recreation

There are no recreational facilities within the vicinity of the Project site. The proposed Project would not impact any recreational facilities and would not result in population growth that would require the construction of new recreational facilities. Under Alternative 2, a new bridge would be built next to the existing bridge and the existing bridge would be retained. No impact to recreational facilities would occur under Alternative 2. The impact would be the same as the proposed Project.

Transportation

Construction of the proposed Project would have temporary impacts on transportation facilities in order to build the new bridge and approach roadways. The Project has been designed to keep the existing bridge open to traffic while the new bridge is being constructed, which would avoid impacts associated with detouring traffic. Safety precautions would be taken during on-site construction work to avoid any transportation-related hazards, such as reflective signs, changeable message boards, cones, and barricades. The Project would also implement Mitigation Measure TRAN-1, which requires the construction contactor to notify emergency service providers of the construction schedule and potential for delays. The Project would not have any impact on VMT because the Project would not increase the roadway capacity or encourage growth within the Project area. Therefore, impacts of the proposed Project related to transportation would be less than significant with mitigation incorporated.

Under Alternative 2, the existing bridge would remain in place. However, as described above, leaving the existing bridge in place would present a variety of hazards to the public because the bridge is scour critical and at risk of collapse from earthquakes and landslides. As such, leaving the existing bridge in place presents a transportation-related hazard that would be avoided by implementing the proposed Project. Therefore, long-term impacts of the proposed Project related to transportation hazards would be less than under Alternative 2.

Utilities and Service Systems

The proposed Project would relocate utility infrastructure on the existing bridge, including electrical lines and telecommunications lines, to the proposed new bridge. These facilities would be relocated within the Project site and would not cause significant environmental effects. The

proposed Project would not result in an increased demand for water or wastewater service and would not generate solid waste in excess of state or local standards. The proposed Project would comply with all management and reduction statutes related to solid waste. Under Alternative 2, the utilities would also likely be relocated to the new bridge, no increased demand for water or wastewater service would be generated, and work would comply with all management and reduction statues related to solid waste. Less waste would be generated under Alternative 2 than under the proposed Project because the existing bridge would not be demolished. Therefore, the impact of Alternative 2 would be less than the proposed Project and would remain less than significant.

Wildfire

The proposed Project would have a less-than-significant impact related to wildfire. The proposed Project would not impair any emergency response or evacuation plans. Construction activities on-site would temporarily increase hazards related to wildfire as there is potential for equipment to create sparks which could ignite nearby vegetation. However, the Project would follow all relevant policies and regulations relating to equipment use and construction safety, which would ensure that any ignition would be extinguished swiftly. The Project would not expose any people or structures to risks associated with post-fire hazards, such as downstream flooding or landslides. Although the proposed Project would alter local drainage patterns, it would not change the topography in a way that would present exacerbated risks to people within the vicinity of the Project site. Once the Project is constructed, the wildfire risk would be similar to existing conditions on-site. Under Alternative 2, construction activities would occur on-site but would be less extensive than for the proposed Project, with the existing bridge remaining in place. Therefore, Alternative 2 would not present any increased risk of wildfire; the impact would be the same as the proposed Project.

7.5 Environmentally Superior Alternative

In addition to the discussion and comparison of impacts of the proposed Project and the alternatives, Section 15126.6 of the CEQA Guidelines requires that an “environmentally superior” alternative be selected and the reasons for such a selection disclosed. In general, the environmentally superior alternative is the alternative that would be expected to generate the least significant environmental impacts. Identification of the environmentally superior alternative is an informational procedure and the alternative selected may not be the alternative that best meets the goals or needs of the project applicant. Section 15126.6(e)(2) of the CEQA Guidelines also requires that if the environmentally superior alternative is the “no project” alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

Based on the analysis provided in the above sections and in the Alternatives Comparison Table 7-1, it has been determined that Alternative 1: No Project would be the environmentally superior alternative. Alternative 1 would avoid the proposed Project’s significant and unavoidable impact on cultural resources involving the loss of the existing historic bridge. Although Alternative 1 would likely result in the eventual deterioration and loss of the existing bridge through natural means, the direct and short-term known impacts of the proposed Project would be avoided.

As noted above, the CEQA requires that another alternative be identified as “environmentally superior” whenever the “no project” alternative (Alternative 1) is concluded to be environmentally superior. In this case, the proposed Project would be considered environmentally superior to Alternative 2. Although Alternative 2 would retain the existing bridge and thus would avoid the Project’s significant impact on cultural resources, it would generate greater direct

short-term impacts than the proposed Project and would pose the threat of greater indirect future impacts resulting from eventual deterioration and/or collapse of the existing bridge as compared to the proposed Project. Alternative 2 would result in increased impacts on aesthetics, biological resources, geology and soils, hazards and hazardous materials, hydrology and water quality, and transportation.

As shown in Table 7-2, neither Alternative 1 nor Alternative 2 would attain all of the Project objectives.

Table 7-1. Alternatives Comparison - Impacts

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
AESTHETICS			
a) Would the project have a substantial adverse effect on a scenic vista?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *More significant than proposed Project*
b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
c) In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *More significant than proposed Project*
d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
AGRICULTURE			
a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
d) Would the project result in a loss of forest land or conversion of forest land to non-forest use?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
e) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
AIR QUALITY			
a) Would the project conflict with or obstruct implementation of the applicable air quality plan?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Less than proposed Project*
c) Would the project expose sensitive receptors to substantial pollutant concentrations?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Less than proposed Project*
d) Would the project result in other emissions (such as those leading to odors) affecting a substantial number of people?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
BIOLOGICAL RESOURCES			
a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact *Similar to proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Greater than proposed Project*
c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Less than proposed Project*
e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No Impact	No Impact *Less than proposed Project*	No Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
CULTURAL RESOURCES			
a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	Significant and Unavoidable Impact	No Impact *Less than proposed Project*	No Impact *Less than proposed Project*
b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
ENERGY			
a) Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Less than proposed Project*
b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Less than proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
GEOLOGY AND SOILS			
a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:			
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	No Impact	Significant and Unavoidable Impact *Greater than proposed Project*	Significant and Unavoidable Impact *Greater than proposed Project*
ii) Strong seismic ground shaking?	Less-than-Significant Impact	Significant and Unavoidable Impact *Greater than proposed Project*	Significant and Unavoidable Impact *Greater than proposed Project*
iii) Seismic-related ground failure, including liquefaction?	Less-than-Significant Impact	Significant and Unavoidable Impact *Greater than proposed Project*	Significant and Unavoidable Impact *Greater than proposed Project*
iv) Landslides?	Less-than-Significant Impact	Less than Significant Impact *Same as proposed Project*	Less-than-Significant Impact *Same as proposed Project*
b) Would the project result in substantial soil erosion or the loss of topsoil?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Greater than proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial direct or indirect risks to life or property?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
GREENHOUSE GAS EMISSIONS			
a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Less than proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
b) Would the project conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
HAZARDS AND HAZARDOUS MATERIALS			
a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Less-than-Significant Impact	Less-than-Significant Impact *Greater than proposed Project*	Less-than-Significant Impact *Greater than proposed Project*
c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No Impact	No Impact *Less than proposed Project*	No Impact *Same as proposed Project*
d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No Impact	No Impact *Less than proposed Project*	No Impact *Same as proposed Project*
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	No Impact	No Impact *Less than proposed Project*	No Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
HYDROLOGY AND WATER QUALITY			
a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *More significant than proposed Project*
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
i. Result in substantial erosion or siltation on- or off-site?	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact *Greater than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Greater than proposed Project*
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
iii. Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
iv. Impede or redirect flood flows?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
d) In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Less than proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
LAND USE			
c) Would the project physically divide an established community?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
d) Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
MINERAL RESOURCES			
c) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
d) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
NOISE			
a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Less than proposed Project*
b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Less than proposed Project*
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
POPULATION AND HOUSING			
a) Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
PUBLIC SERVICES			
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:			
i) Fire Protection?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
ii) Police Protection?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
iii) Schools?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
iv) Other public facilities?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
RECREATION			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
b) Would the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
TRANSPORTATION			
a) Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Less-than-Significant Impact	Less-than-Significant Impact *Greater than proposed Project*	Less-than-Significant Impact *Greater than proposed Project*
d) Would the project result in inadequate emergency access?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
TRIBAL CULTURAL RESOURCES			
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:			
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*
UTILITIES AND SERVICE SYSTEMS			
a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
b) Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
c) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	No Impact	No Impact *Same as proposed Project*	No Impact *Same as proposed Project*
d) Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Less than proposed Project*
e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
WILDFIRE			
a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?	Less-than-Significant Impact with Mitigation Incorporated	No Impact *Less than proposed Project*	Less-than-Significant Impact with Mitigation Incorporated *Same as proposed Project*

IMPACT AREA	PROPOSED PROJECT	ALTERNATIVE 1: NO PROJECT	ALTERNATIVE 2: RETAIN EXISTING BRIDGE
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or,	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	Less-than-Significant Impact	No Impact *Less than proposed Project*	Less-than-Significant Impact *Same as proposed Project*

Table 7-2. Alternatives Comparison – Ability to Meet Basic Objectives of the Project

PROJECT OBJECTIVE	Proposed Project	Alternative 1: No Project	Alternative 2: Retain Existing Bridge
Ensure safe crossing for vehicles, bicyclists, and pedestrians along Chalk Hill Road over Maacama Creek by replacing or rehabilitating the existing bridge.	Yes	No	No
Satisfy the requirements of California's Local Bridge Seismic Retrofit Program to protect the traveling public from earthquake related hazards.	Yes	No	Yes
Satisfy the requirements of the Federal Highway Administration's Highway Bridge Program and ensure the project meets the civil, traffic, environmental, structural, and safety standards therein	Yes	No	Yes

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APPENDIX A. NOTICE OF PREPARATION

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NOTICE OF PREPARATION

of a Draft Environmental Impact Report, Notice of Public Scoping Meeting

To:	State Clearinghouse, Responsible and Trustee Agencies, and Interested Parties and Organizations
Date:	April 4, 2025
Project Title:	Chalk Hill Road Bridge Replacement Project
Comment Period:	April 4, 2025, to May 5, 2025
Scoping Meeting:	April 16, 2025, see location and time details below
Lead Agency:	County of Sonoma
Project Location:	Along Chalk Hill Road in unincorporated Sonoma County, approximately 1.25 miles south of Highway 128 (Refer to Figure 1)
Lead Agency Contact:	Samuel Baumgardner-Kranz, PE Sonoma Public Infrastructure 400 Aviation Boulevard Santa Rosa, CA 95403 Samuel.baumgardner-kranz@sonoma-county.org

NOTICE IS HEREBY GIVEN THAT the County of Sonoma will be the Lead Agency under the California Environmental Quality Act (CEQA) and will prepare a Draft Environmental Impact Report (EIR) for the proposed project. This Notice of Preparation (NOP) includes a project description and an overview of the potential impacts that will be addressed in the Draft EIR. The County requests comments and guidance on the scope and content of the Draft EIR from responsible and trustee agencies, interested public agencies, organizations, and the general public in compliance with CEQA (California Public Resources Code, Section 2100 et seq.), and the State CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3). In accordance with State CEQA Guidelines Section 15082(a) and 15375, the County prepared and released this NOP of an EIR.

This NOP provides a brief description of the Chalk Hill Road Bridge Replacement Project (proposed project), the County's preliminary identification of the potential environmental issues to be analyzed in the EIR, and information on how to provide written comments and verbal comment (as part of a Public Scoping Meeting) on the scope of the EIR.

The County invites any and all input and comments regarding the preparation of the Draft EIR. If applicable, please indicate a contact person for your agency or organization. If your agency is a responsible agency as defined by CEQA Guidelines Section 15381, your agency may use the environmental documents prepared by the County when considering permits or approvals for actions regarding the project.

Public Scoping Meeting

The County will hold a public scoping meeting to provide an opportunity for agency staff and interested members of the public to submit verbal comments on the scope of the environmental issues to be addressed in the EIR. The scoping meeting will be held at **7:00 p.m. on Wednesday, April 16, 2025**, at the following address:

Alexander Valley Community Hall
5512 Highway 128
Geyserville, CA 95441

If you have questions regarding this NOP or the scoping meeting, please contact Samuel Baumgardner at samuel.baumgardner-kranz@sonoma-county.org.

Written Comments

If applicable, please indicate a contact person for your agency or organization when submitting comments. Submit written comments to either of the below within 30 days of the date of this notice by 5:00 p.m. on May 5, 2025:

Email:	samuel.baumgardner-kranz@sonoma-county.org
Regular mail:	Samuel Baumgardner-Kranz, PE Sonoma Public Infrastructure 400 Aviation Boulevard Santa Rosa, CA 95403

All commenters who provide an email address will be added to the Interested Parties List for future updates on the proposed project.

Project Location

The 6.38-acre project site is located along Chalk Hill Road approximately 1.25 miles south of State Route 128 within the eastern portion of Sonoma County (Figure 1. Project Location Map). The project site includes portions of Chalk Hill Road, Maacama Creek, and surrounding parcels (Figure 2. Aerial Photograph of the Project Site). The project site also includes an existing one-lane bridge that carries Chalk Hill Road over Maacama Creek, which is a historical landmark due to its age and unique character. The majority of the proposed right-of-way for bridge replacement work is located within Assessor's Parcel Number (APN) 132-080-023, with small portions crossing into APNs 132-060-013 and 132-080-003. Construction staging areas occur in APNs 132-060-013, 132-080-022, and 132-080-017.

The project site has a General Plan land use designation of Land Intensive Agriculture. The zoning designation is LIA (Land Intensive Agriculture) with a Scenic Resource (SR) combining zone along Chalk Hill Road, a Riparian Corridor (RC 100/50) and Oak Woodland (OAK) combining zone along Maacama Creek, and Historic District (HD) along the Chalk Hill Road bridge. APN 132-060-013 also has a Valley Oak Habitat (VOH) combining zone and an Accessory Dwelling Unit Exclusion (Z) combining zone.

Project Background

The existing bridge along Chalk Hill Road over Maacama Creek was constructed in 1915. Based on Caltrans Bridge Inspection Reports prepared in 2013, 2016, and 2017, the bridge is "scour critical" meaning that the bridge is highly vulnerable to "scour," defined as the erosion of sediment around the foundation of a structure by flowing water. Scour could potentially cause instability or failure of the bridge, especially during flood events.

Several methods were considered to rehabilitate the existing historic bridge. However, due to the extent of identified deficiencies requiring a degree of seismic retrofitting, the necessary improvements to the existing bridge would render it

unrecognizable, adversely impacting its historic features. Although some of the considered retrofit methods are feasible, it was determined that those methods would destroy the historic features of the bridge and render the structure functionally obsolete. Therefore, the purpose of the project is to ensure safe crossing for vehicles, bicyclists, and pedestrians over Maacama Creek by replacing the existing bridge.

Project Description

The proposed project includes constructing a new replacement bridge then demolishing the existing bridge and installing scour countermeasures along the south creekbank.

The replacement bridge would be positioned downstream (west) of the existing bridge, crossing Maacama Creek with a single-span concrete box girder supported by reinforced concrete abutments. Retaining structures would be built along the west side of the bridge at the north approach roadway to minimize the take of farmland for new right-of-way. The replacement bridge would have two 11-foot lanes and two 6-foot shoulders for a total clear roadway width of 34 feet, which meets minimum American Association of State Highway and Transportation Officials standards for an average daily traffic count of 400 to 1,500 trips and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed-use.

The project would be constructed in two construction seasons. The first season would consist of construction site preparation, constructing the new bridge, installing retaining walls, configuring the approach roadways to the new bridge, and reconfiguring the Young Road and Chalk Hill Road intersection. The existing bridge would remain open during the first construction season to maintain traffic flows. Once the replacement bridge and new approach roadways are constructed, the traffic will be switched onto the new bridge at the end of the first construction season. The second season would consist of demolishing the existing bridge, installing scour countermeasures, and revegetating excavated areas with native vegetation.

Construction of the project would require access to the creek bed to create a stream diversion/fish channel, to construct temporary falsework to build the replacement bridge, to install slope stability tiebacks, to implement south creekbank stabilization, and to demolish the existing bridge. Once the dry season starts, the contractor would access the creek bed from three locations downstream of the existing bridge. Stream protections, including stormwater pollution prevention techniques, would be implemented at all access points.

Project Alternatives

The EIR will evaluate a reasonable range of project alternatives that, consistent with CEQA, meet most of the project objectives and reduce or avoid potential environmental effects, including a required No Project Alternative.

Potential Permits and Entitlements

Potential permits, approvals, and entitlements required for the project include:

- Clean Water Act Section 404 Nationwide Permit – U.S. Army Corps of Engineers
- Clean Water Action Section 401 Water Quality Certification – North Coast Regional Water Quality Control Board
- Section 1602 Lake and Streambed Alteration Agreement – California Department of Fish and Wildlife
- Notice of Intent for coverage under the statewide Construction General Permit – State Water Resources Control Board
- Endangered Species Action Section 7 Biological Opinion – National Marine Fisheries Service
- Grading, building, and encroachment permits – Sonoma County
- Project approval – Sonoma County

Potential Environmental Effects

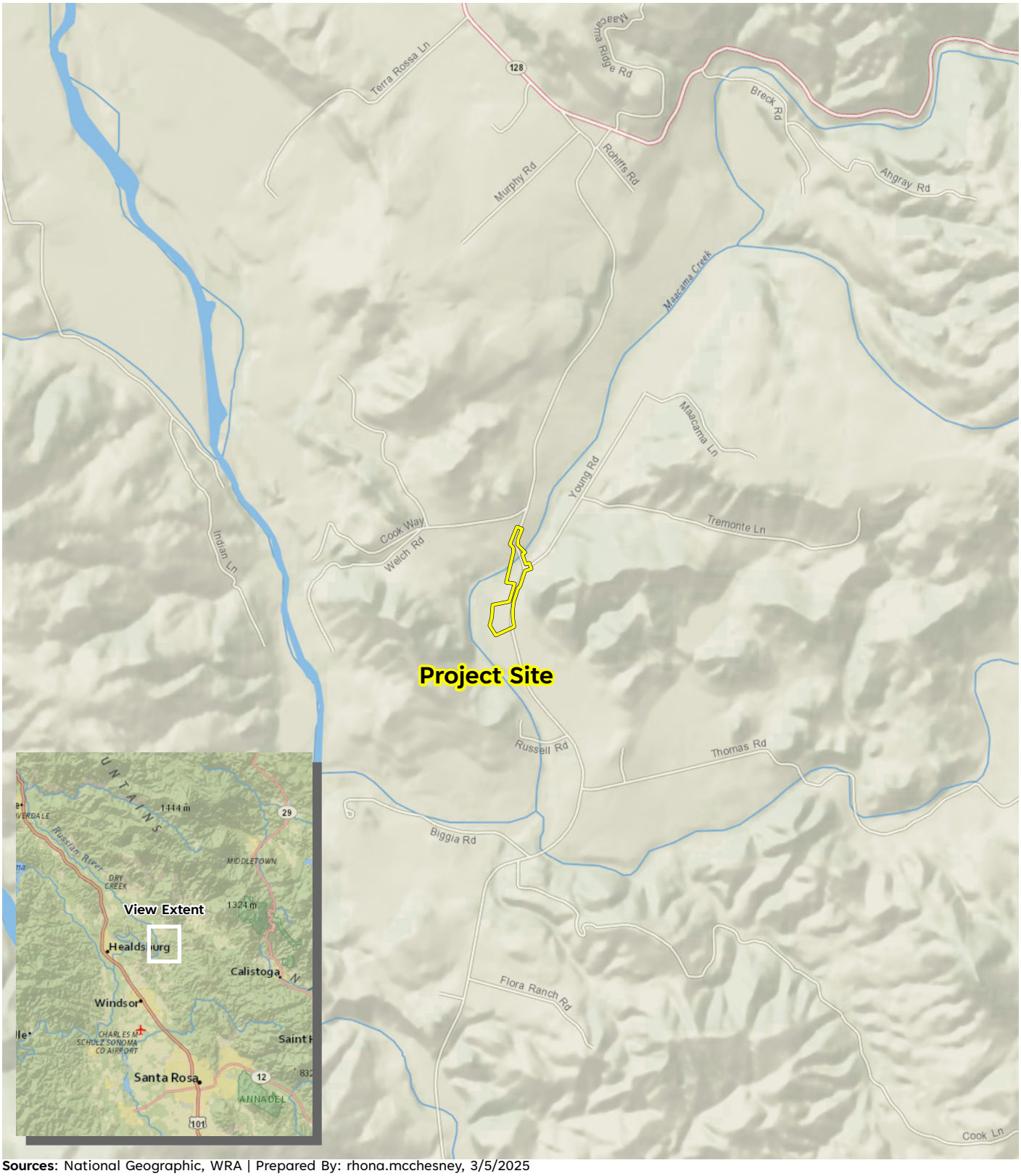
The County has determined that implementing the proposed project may result in significant environmental impacts; therefore, an EIR will be prepared. The EIR will address all environmental topic areas identified in Appendix G of the CEQA Guidelines, with a particular focus on the following topic areas:

- Agriculture and Forestry Resources
- Biological Resources
- Cultural Resources
- Hydrology/Water Quality
- Land Use/Planning
- Transportation/Traffic

The EIR will analyze the reasonably foreseeable and potentially significant adverse effects of the proposed project (both direct and indirect). The EIR also will evaluate the cumulative impacts of the project when considered in conjunction with other related past, present, and reasonably foreseeable future projects.

Next Steps

After the Draft EIR is completed, the County will issue a Notice of Availability of a Draft EIR to inform the public and interested agencies, groups, and individuals of how to access the Draft EIR and provide comments.



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name:Fig 1 Location CEQA

Sources: National Geographic, WRA | Prepared By: rhona.mcchesney, 3/5/2025

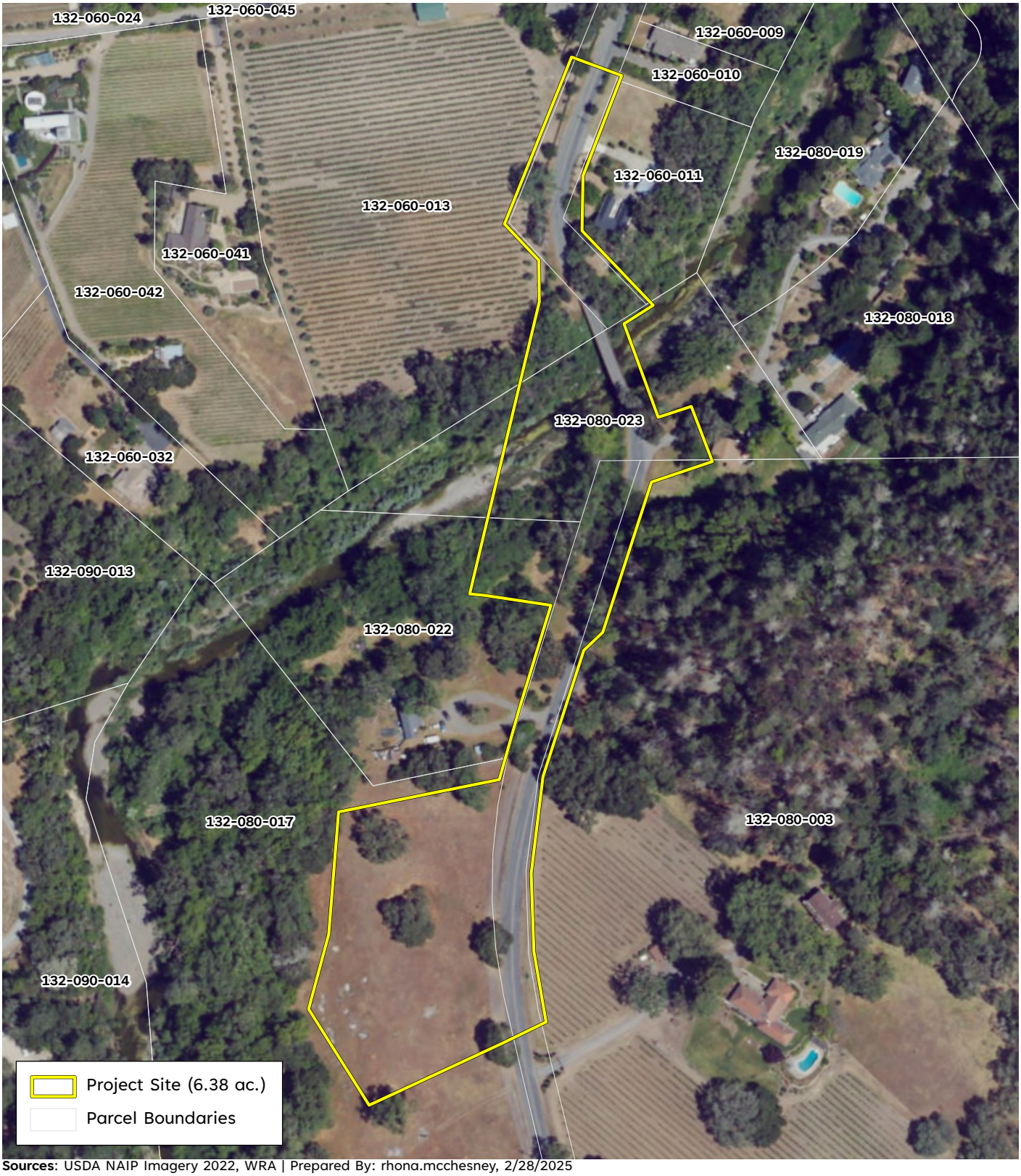
Figure 1. Project Site Regional Location

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 0.5 1 Miles

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wra Environmental Consultants



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\27316Base\27316Base.aprx Layout Name: Fig 2 Aerial CEQA

Sources: USDA NAIP Imagery 2022, WRA | Prepared By: rhona.mcchesney, 2/28/2025

Figure 2. Aerial Photograph of the Project Site

Chalk Hill Road Bridge Replacement
Sonoma County, California

0 250 500 Feet

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wra Environmental Consultants

APPENDIX B. AIR QUALITY ASSESSMENT

CHALK HILL ROAD BRIDGE REPLACEMENT AIR QUALITY ASSESSMENT

Sonoma County, California

July 7, 2025

Prepared for:

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Introduction

This report addresses the air quality impacts and construction-related health risks for California Environmental Quality Act (CEQA) purposes associated with the replacement of the existing bridge over Maacama Creek on Chalk Hill Road in unincorporated Sonoma County, California. The air quality impacts from this project include demolition of the existing bridge, preparation of the site for the new bridge, construction of the new bridge, paving, and minor modifications to the roadway connections. Air pollutants emissions associated with construction of the project were estimated using appropriate emissions models. In addition, the potential health risk impact to nearby sensitive receptors from construction-related toxic air contaminants (TACs) was evaluated.

Project Description

Chalk Hill Road is a rural north-south minor collector road in eastern Sonoma County. The road begins at Pleasant Avenue/Faught Road to the south and proceeds north 8.03 miles to its terminus at State Highway 128 in unincorporated Sonoma County. The existing one-lane bridge that carries Chalk Hill over Maacama Creek is a Sonoma County landmark that is eligible for inclusion on the National Register of Historic Places due to its age and unique character. However, the existing bridge is at risk of collapse from earthquakes and landslides, is scour critical, and has been deemed by the Caltrans to be functionally obsolete. The purpose of the Chalk Hill Road Bridge Replacement Project (project, proposed project) is to ensure safe crossing for vehicles, bicyclists, and pedestrians over Maacama Creek by replacing the existing bridge.

The existing one-lane substandard bridge would be replaced with a new two-lane crossing located downstream (west) of the existing bridge, crossing the creek with a single-span concrete box girder supported by reinforced concrete abutments. The replacement bridge would have two 11-foot lanes and two 6-foot shoulders for a total clear roadway width of 34 feet. Retaining structures would be built along the west side of the bridge at the north approach roadway to minimize the take of farmland for new right-of-way. The new bridge would be constructed first, then, once completed, the old bridge would be demolished and scour countermeasures installed along the south creekbank.

Setting

The project is in Northern Sonoma County, which is part of the North Coast Air Basin under the jurisdiction of the Northern Sonoma County Air Pollution Control District (NoSoCo Air District). Ambient air quality standards have been established at both the State by the California Air Resources Board and at the federal level by the United States Environmental Protection Agency (EPA). The North Coast Air Basin meets all established ambient air quality standards. However, the NoSoCo Air District is located adjacent to the San Francisco Bay Area Air Basin under the jurisdiction of the Bay Area Air District. The Bay Area meets all ambient air quality standards except for ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$). Because the NoSoCo Air District does not have CEQA guidance documentation for significant impacts determinations, the Bay Area CEQA thresholds were used to determine the level of significance for project construction and health risks.

Bay Area Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X) and aggravate respiratory and cardiovascular diseases, reduce lung function, and increase coughing and chest discomfort. These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. Therefore, high ozone concentrations are not often measured in the NoSoCo Air District jurisdiction.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children. Construction projects temporarily increase PM_{10} and $PM_{2.5}$ concentrations closest to the activity, but if managed well, will not contribute to exceedances of ambient air quality standards.

TACs are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer). TACs are found in ambient air and are caused by industrial and construction activities, agriculture operations, fuel combustion, and commercial operations (e.g., dry cleaners and gas stations). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a construction site). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC associated with roadway and bridge construction projects. According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complicated scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs. The most recent Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines were published in February of 2015.[1]

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care

[1] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

facilities, elementary schools, and parks. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Therefore, residential locations are assumed to include infants and small children. The closest sensitive receptors to the project area are children that may be living in the single-family houses adjacent to Chalk Hill Road nearest the bridge.

Regulatory Agencies

Federal Regulations

The EPA sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining activities (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the federal standards.

In the past decade, the EPA has established several emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of nitrogen oxides, or NO_X, and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified DPM as a probable carcinogen. Implementation of the current heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce PM and NO_X emissions from diesel engines up to 95 percent by 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with EPA emission standards.[2]

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The current EPA standard for sulfur content in diesel fuel is to 15 parts per million weight (ppmw). This low sulfur highway fuel, also referred to as ultra-low sulfur diesel (ULSD), is required for use by all vehicles in California.

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles[3]. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the Federal on-road and

[2] USEPA, 2000. *Regulatory Announcement, Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. December.

[3] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

CARB has adopted and implemented a number of regulations for stationery and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or to have their engines replaced to meet 2010 or later engine standards which have much lower DPM and $PM_{2.5}$ emissions. This regulation has substantially reduced emissions over the last decade. While new trucks and buses will meet stricter federal standards, CARB regulations continue to accelerate the rate at which the fleet either turns over or is retrofitted to meet higher emissions standards.

CARB has also adopted and implemented regulations to reduce DPM and NO_X emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NO_X exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent federal off-road equipment engine emission limits for new vehicles, will continue to reduce emissions of DPM and NO_X.

Sonoma County Transportation Authority

The Sonoma County Transportation Authority (SCTA) was created in 1990 and is governed by a twelve-member Board of Directors representing each of the nine cities (Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor) and the Sonoma County board of Supervisors. It acts as the countywide planning and fund programming agency for transportation and performs a variety of important functions related to advocacy, project management, planning, finance, grant administration and research. SCTA is responsible for prioritizing most state and federal funds available to Sonoma County for roadway, transit, bicycle, and pedestrian projects. Additionally, SCTA serves as the entity responsible for planning and prioritizing transportation improvement projects at a countywide level and provides project management in partnership with Caltrans on the State Highway system.

SCTA and Sonoma County are both part of the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), which serve as the metropolitan planning organization for the Bay Area. ABAG and MTC develop the regional transportation plans and transportation improvement programs for the Bay Area which are needed to allocate State and federal funding to transportation projects in Sonoma County.

Sonoma County

The County is involved in the construction, planning, operation, and management of public infrastructure projects in the unincorporated areas. Specifically, the County's Department of Transportation and Public Works - Road Division conducts engineering, construction, and

maintenance activities including pavement preservation and bridge retrofit projects on County roads and bridges. The County then works with the SCTA and MTC to get roadway and bridge projects funded.

Northern Sonoma County Air Pollution Control District (NoSoCo Air District)

The NoSoCo Air District has jurisdiction over the northern portions of unincorporated Sonoma County and the incorporated portions including Healdsburg, Cloverdale, and Windsor. The NoSoCo Air District is the lead agency in developing plans to address attainment and maintenance of ambient air quality standards and has permit authority over most types of stationary sources of pollution. It conducts inspection of stationary sources and enforces air quality regulations, including setting fees, levying fines, and imposing enforcement actions. The air district is also responsible for ensuring that public nuisances are minimized. Many air districts have also established emissions thresholds for pollutants so that CEQA significance could be determined for both projects and plans. However, the NoSoCo Air District has not established specific CEQA thresholds or guidance.

The entire North Coast Air Basin operates under one set of Air Quality Control Rules (Rules). Chapter I covers general provisions, Chapter II Permits, Chapter III Fees, Chapter VI Prohibitions, Chapter V Enforcement & Penalty Actions, and Chapter VI covers Hearing Board & Variance Procedures. The emissions thresholds in the rules primarily apply to stationary sources and would not be applicable to construction emissions sources. However, Rule 430 – Fugitive Dust Emissions would apply to the project. It lists the reasonable precautions that shall be taken to prevent particulate matter from becoming airborne. These are often referred to as "best management practices" or BMPs and are required for all construction projects in Northern Sonoma County. They include, but are not limited to:

- Covering open bodied trucks when used for transporting materials likely to give rise to airborne dust.
- The use of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.
- The application of asphalt, oil, water or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
- The paving of roadways and their maintenance in a clean condition.
- The prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

AIR QUALITY IMPACTS AND MITIGATION MEASURES

Impact AIR-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable State or federal ambient air quality standard?

The North Coast Air Basin is considered in attainment or unclassified for all criteria pollutants listed under both the Federal Clean Air Act and the California Clean Air Act. Therefore, the Project would not considerably increase emissions for any pollutant for which the air shed in non-attainment so long as emissions are below the stationary source significance rates used to determine compliance with federal New Source Review (NSR) regulations. The NoSoCo Air District NSR rates are provided in Table 1.

Table 1. NoSoCo NSR Significant Emissions Rate

Criteria Air Pollutant	Emissions Rate (tons/yr)
VOC	40
NO_x	40
PM_{10}	15
$PM_{2.5}$	10

VOC = volatile organic compounds, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

The Bay Area, however, is considered a non-attainment area for ground-level ozone and $PM_{2.5}$ under both the Federal Clean Air Act and the California Clean Air Act and for PM_{10} under the California Clean Air Act. As part of an effort to attain and maintain ambient air quality standards for ozone and PM, the Bay Area Air District has established CEQA thresholds of significance for ozone precursors pollutants (ROG and NO_X), PM_{10}, and $PM_{2.5}$ that apply to construction impacts. Given the County is part of the Bay Area metropolitan planning area, and the fact that NoSoCo Air District has not needed to establish CEQA significant thresholds for projects in Northern Sonoma County, Bay Area Air District CEQA significance thresholds were used to assess the construction emissions impacts of the proposed Project. Table 2 summarizes the CEQA thresholds used for the analysis of construction impacts.

Table 2. Bay Area CEQA Emissions Significance Thresholds

Criteria Air Pollutant	Construction Thresholds
	Average Daily Emissions (lbs/day)
ROG	54
NO_x	54
PM_{10}	82 (Exhaust)
$PM_{2.5}$	54 (Exhaust)

ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

The emissions thresholds in Tables 1 and 2 are not applicable to roadway operation. Instead, existing roadway emissions are compared to the "build" emissions estimated for the project. An assessment of emissions from Project operations was also conducted. This Project would not increase the vehicle miles traveled in the County, nor would it alter traffic speeds or volumes. Therefore, emissions from the operation of the Project would be comparable to existing conditions.

Construction Period Emissions

Construction emissions were estimated using the latest version of the California Emissions Estimator Model (CalEEMod) which uses emission factors from CARB's on road vehicle emissions model, EMFAC2021. Detailed construction plans were not available at the time of this analysis. Therefore, equipment quantities and construction phases estimated by CalEEMod were used and adjusted, assuming a limit of no more than three pieces of any type of equipment. Construction was assumed to include both roadway construction and bridge construction with four "default" phases: Grubbing and Land Clearing; Grading and Excavation; Drainage, Utilities, & Sub-Grade; and Paving. Total project emissions were adjusted to fit the proposed construction schedule, six-months in 2027 (April to October) and six months in 2028 (May to October). Table 3 presents the construction emissions estimated using CalEEMod. *Attachment 1* lists all the construction inputs provided and entered into CalEEMod.

CalEEMod's linear project type provides emission estimates for both on-site and off-site construction activities for roadway and bridge projects. The Project's total acreage and length (3 acres and 0.3 miles) and satellite imagery were used to estimate those portions of the project that would be roadway construction (2.6 acres and 0.2 miles) and bridge construction (0.4 acres and 0.1 miles). CalEEMod defaults were used for worker trips and haul trips unless specific information was provided by the applicant. Concrete and asphalt deliveries were converted to vehicle haul trips assuming 10 cubic yards (CY) and two trips per delivery. The size of the existing bridge (5,440 sf) was estimated using satellite imagery of the site and entered into CalEEMod to estimate the number of haul trips associated with bridge demolition.

Summary of Estimated Construction Period Emissions

Annual Project emissions were predicted using CalEEMod and allocated to either the 2027 or 2028 construction period based on the workdays for each phase provided by CalEEMod. This resulted in 2027 having 138 workdays and 2028 having 126 workdays for a total of 264. Average daily emissions were provided by CalEEMod for each year and adjusted to reflect the proposed construction schedule. Table 3 shows average daily construction emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ during construction of the project. As indicated in Table 3, construction period emissions would not exceed the Bay Area Air District's CEQA significance thresholds.

Table 3. Construction Emissions Estimate

Year	Source	VOC/ROG	NOx	PM_{10}	$PM_{2.5}$
2027	Emissions (tons per year)	0.46	3.67	0.40	0.18
	NSR Emissions Rates (tons per year)	*40*	*40*	*15*	*10*
	Exceed NSR Rate?	No	No	No	No

Year	Source	VOC/ROG	NOx	PM_{10}	$PM_{2.5}$
	Daily emissions (pounds per day)	2.50	20.09	2.21	0.98
	Bay Area CEQA Threshold (pounds per day)	*54*	*54*	*82*	*54*
	Exceed Threshold?	No	No	No	No
2028	Emissions (tons per year)	0.08	0.66	0.06	0.03
	NSR Emissions Rates (tons per day)	*40*	*40*	*15*	*10*
	Exceed NSR Rate?	No	No	No	No
	Daily emissions (pounds per day)	1.17	11.87	0.54	0.47
	Bay Area CEQA Thresholds (pounds per day)	*54*	*54*	*82*	*54*
	Exceed Threshold?	No	No	No	No
Total/Average	Total Construction (tons)	0.54	4.33	0.28	0.21
	NSR Emissions Rates (tons per day)	*40*	*40*	*15*	*10*
	Exceed NSR Rate?	No	No	No	No
	Project average daily emissions (pounds per day)	4.07	32.79	2.13	1.58
	Bay Area CEQA Thresholds (pounds per day)	*54*	*54*	*82*	*54*
	Exceed Threshold?	No	No	No	No

Construction activities, particularly during grubbing, land clearing, grading, and excavation would generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of materials. Unless properly controlled, vehicles leaving the site would deposit mud on Chalk Hill Road, which could be an additional source of airborne dust after it dries. The NoSoCo Air District's Rule 430 – Fugitive Dust Emissions would apply to the project. Therefore, reasonable precautions, also known as BMPs, shall be taken to prevent particulate matter from becoming airborne.

During any construction period ground disturbance, the contractor shall ensure that basic BMPs are implemented to control dust. Recommended BMPs are listed below and would reduce the air quality impacts associated with project construction to a less-than-significant level. The basic BMPs are:

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- On-site dirt piles or other stockpiled materials shall be covered, wind breaks installed, or water and/or soil stabilizers employed to reduce wind-blown dust emissions. The use of approved nontoxic soil stabilizers shall be incorporated according to manufacturers' specifications to all inactive construction areas.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping

should only be performed in conjunction with thorough watering of the subject roads.

- All vehicle speeds on unpaved roads and surfaces shall be limited to 15 mph.
- All roadway, driveway, and sidewalk paving shall be completed as soon as possible.
- All construction sites shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- All transfer processes involving a free fall of soil or other materials shall be operated in such a manner as to minimize the free fall distance and fugitive dust emissions.
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Open burning shall be prohibited at the project site. No open burning of vegetative waste (natural plant growth wastes) or other legal or illegal burn materials (e.g., trash, demolition debris) may be conducted at the project site. Vegetative wastes shall be chipped or delivered to waste-to-energy facilities (permitted biomass facilities), mulched, composted, or used for firewood. It is unlawful to haul waste materials off-site for disposal by open burning.

Operational Period Emissions

Operational air emissions from the project would be generated primarily from traffic using the new bridge and roadway connections. This Project would not increase the vehicle miles traveled in the County, nor would it alter traffic speeds or volumes. Therefore, emissions from operation of the Project are expected to be less than existing conditions for tailpipe emissions (i.e., ROG, NO_X, and PM). This is due to newer, less polluting vehicles replacing older vehicles being operated in the County. However, the planned population growth in Northern Sonoma County will cause an increase in traffic volumes and vehicle miles of travel (VMT), when compared to existing conditions. Increases in VMT would also increase fugitive road dust sources of PM_{10} and $PM_{2.5}$, which include tire wear and break wear. These increases are anticipated with or without the project. These increases are proportional to VMT. VMT in the area is not assumed to grow more than 2 percent per year, limiting the growth of fugitive road dust emissions to 2 percent or less.

Impact AIR-2: Expose sensitive receptors to substantial pollutant concentrations?

Health risks to nearby receptors can occur given construction equipment would emit DPM, a known TAC.[4] Although temporary, DPM can increase lifetime cancer risks and, in high enough concentrations, cause acute, non-cancer-related health risks.

Health risk impacts from construction activities are assessed by predicting increased lifetime cancer risk and computing the Hazard Index (HI) for non-cancer health risks. This involves estimating on-site DPM emissions, using a dispersion model to calculate pollutant concentrations, and computing cancer risk and HI based on concentration estimates and assumed exposure parameters.

The NoSoCo Air District has not established CEQA significance thresholds for project health risks in Northern Sonoma County. However, it has established de minimis health risk thresholds in its rules for stationary emissions sources. The thresholds are less than or equal to a one in a million increase in cancer risk and/or an HI of 1 or less. Projects with potential health risks above de minimis levels are allowed to conduct a refined health risk assessment and offer risk mitigation to show risks will be less than or equal to a ten in a million increase in cancer risk and/or an HI of 10 or less.[5]

The Bay Area Air District has established CEQA significance thresholds and methodologies for estimating project health risks. They use less than or equal to a ten in a million increase in cancer risk and/or an HI of 1 as thresholds. They also have established exposure parameters and risk calculation methodologies to support CEQA significance determinations.[6]

Therefore, a health risk assessment was conducted for Project construction activities based on the Bay Area Air District's methodologies, estimated DPM emissions/concentrations, and significance thresholds of ten in a million increase in cancer risk and/or an HI of 1. *Attachment 2* provides the materials developed to estimate health risk impacts associated with project construction.

Health Risk from Project Construction Activity

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. Although it was concluded in the previous sections (see Table 3) that construction exhaust air pollutant emissions would not contribute substantially to existing or projected ambient air quality violations, construction exhaust emissions still pose health risks for sensitive receptors such as surrounding residents. To conduct the health risk assessment, on site DPM emissions were estimated using CalEEMod, concentrations estimated using a dispersion model, and risks calculated using Bay Area Air District methodologies.

[4] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.
[5] Regulation 1, Chapter 2, Section 225.5.1 and 225.5.2
[6] Bay Area Air District, 2023, *Appendix E of the 2022 BAAQMD CEQA Guidelines.* April.

Construction Period Emissions

The CalEEMod model provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and on-road vehicles. Total uncontrolled DPM emissions from the construction site were estimated to be 0.18 tons (370 pounds). The on-road emissions are a result of haul truck travel during grading activities, worker travel, and vendor deliveries during construction. A trip length of a half mile was used to represent vehicle travel while at or near the construction site. It was assumed emissions from on road vehicles traveling at or near the site would occur at the construction site.

Dispersion Modeling

The EPA AERMOD dispersion model was used to predict DPM concentrations at sensitive receptors (i.e., residents) in the vicinity of the project construction area. The AERMOD dispersion model is a recommended model for use in modeling ambient impacts of these types of emission activities.[7] Combustion equipment exhaust emissions were modeled as a series of point sources with a 9-foot release height (i.e., construction equipment exhaust stack height) placed at 16.4-feet (5-meter) intervals throughout the construction site. This resulted in 484 individual point sources being used to represent mobile equipment DPM exhaust emissions in the construction area Construction emissions were modeled as occurring daily between 7:00 a.m. to 7:00 p.m. between the months of April and September.

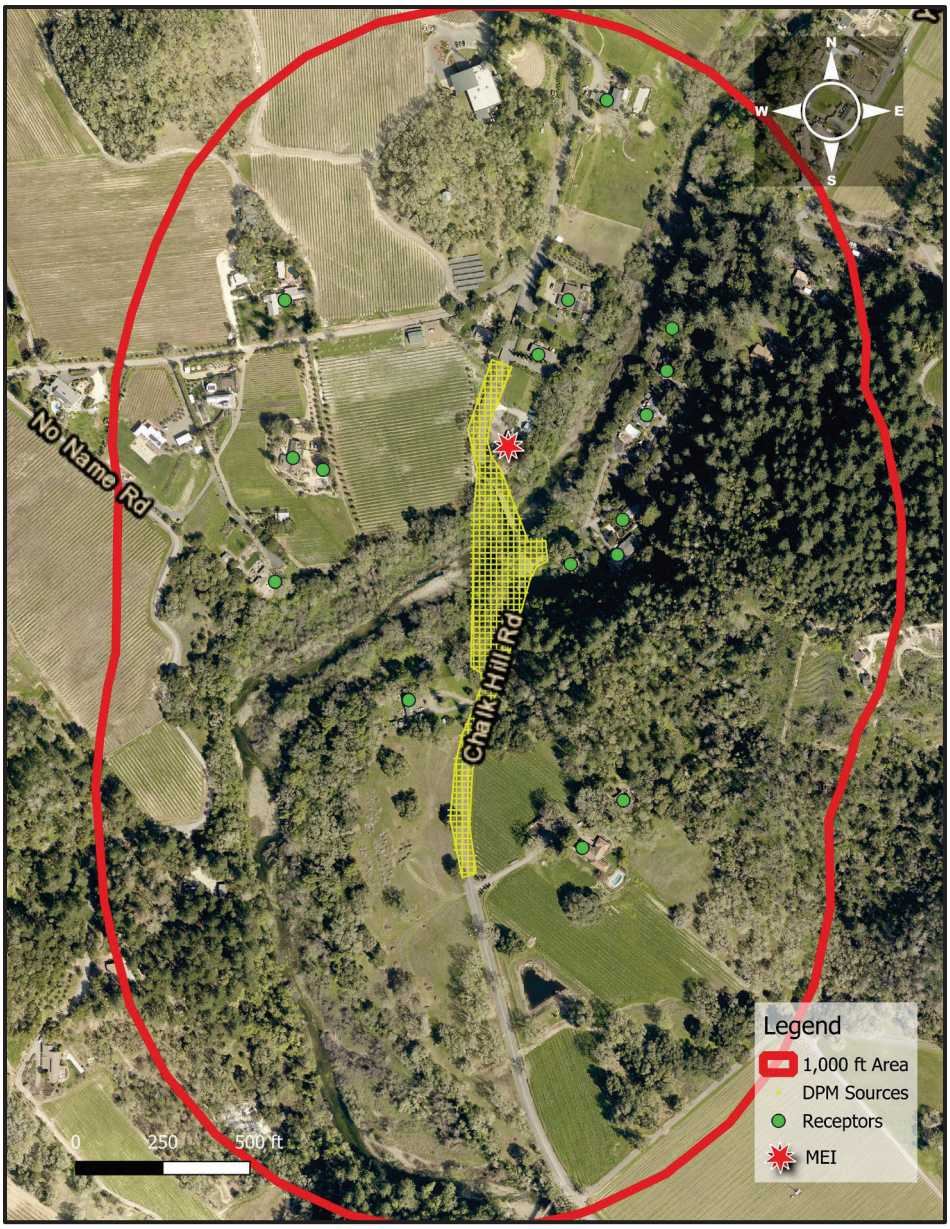
A five-year data set (2013-2017) of hourly meteorological data from Sonoma County Airport prepared for use with the AERMOD model by Bay Area Air District was used. Annual DPM concentrations from construction activities were calculated at nearby sensitive receptors within 1,000 feet of the project site. Receptor heights of 4.9 feet (1.5 meters) were used to represent the breathing heights at nearby single-family homes. Figure 1 shows the modeled construction area and the receptors used in the analysis.

Construction Impacts

The maximum modeled annual DPM concentration, and thus the maximally exposed individual (MEI), was identified as those living at a single-family residence adjacent to the east side of Chalk Hill Road (as shown in Figure 1). Using the maximum modeled annual DPM concentrations, maximum increased cancer risks were calculated using Bay Area Air District recommended methods and exposure parameters.[8] Non-cancer health hazards were also calculated and identified. *Attachment 2* to this report includes the emission calculations used for the construction source modeling and the construction cancer risk calculations.

[7] Bay Area Air District, 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May.
[8] Bay Area Air District, 2023, *Appendix E of the 2022 BAAQMD CEQA Guidelines.* April.

Figure 1. Project Construction Site, Locations of Off-Site Sensitive Receptors, and Locations of TAC Impacts



Results indicate the unmitigated maximum increased cancer risks from construction exceed the CEQA significance threshold of greater than 10.0 per million for cancer risk. However, the estimated non-cancer risk (HI) is well below 1. With the incorporation of *Mitigation Measure AQ-1,* the project cancer risk from construction would not exceed the 10.0 per million significance threshold. Table 4 summarizes the maximum cancer risks and HIs for project related construction activities affecting the off-site residential MEI. Implementing *Mitigation Measure AQ-1* would reduce the increased cancer risk to nearby residential areas from construction, assuming infant exposure, by 83 percent.

Table 4. Construction Risk Impacts at the Off-site Residential MEI

Source		Cancer Risk (per million)	Hazard Index
Project Construction	Unmitigated	**34.78 (infant)**	0.21
	Mitigated*	6.01 (infant)	<0.01
	CEQA Threshold	***10***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*
	Mitigated*	*No*	*No*

* Mitigation Measure AQ-1 includes construction equipment engines with Tier 4 Final emissions certifications.

Mitigation Measure AQ-1: **Selection of equipment during construction to minimize emissions.**

To mitigate potential cancer risks associated with project construction, the project should develop a plan demonstrating that the off-road equipment used on site to construct the project would achieve a fleet-wide average 72-percent reduction in DPM exhaust emissions or greater. One feasible plan to achieve this reduction would include the following:

- All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 4 Final engines. Where Tier 4 equipment is not available, exceptions could be made for equipment that includes CARB-certified Level 3 Diesel Particulate Filters or equivalent. Equipment that is electrically powered or uses non-diesel fuels would also meet this requirement.

- Idling time of diesel-powered construction equipment and trucks would be limited to no more than two minutes. Clear signage of this idling restriction would be provided for construction workers at all access points.

- The primary contractor shall be responsible for ensuring that all construction equipment is properly tuned and maintained before and for the duration of on-site operation.

- Where accessible, existing power sources (e.g., power poles) or clean-fuel generators shall be used rather than temporary power generators.

Effectiveness of Mitigation Measure AQ-1

CalEEMod was used to estimate emissions associated with this mitigation measure assuming that all diesel equipment used meets EPA Tier 4 Final engines standards. With the implementation of *Mitigation Measure AQ-1*, the cancer risk levels from the project's construction would be reduced by approximately 83 percent and would not exceed the CEQA significance threshold for increased cancer risk.

Health Risks from Project Operation

The EPA has identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-hazard contributors from the 2011 National Air Toxics Assessment.[9] These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (DPM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While the Federal Highway Administration (FHWA) considers these the priority mobile source air toxics (MSATs), the list is subject to change and may be adjusted in consideration of future federal rules.

EPA vehicle emissions and fuel standards will dramatically decrease MSAT emissions in the future through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOVES3 emissions model, even if vehicle activity (i.e., VMT) increases by 31 percent from 2020 to 2060 as forecast, a combined reduction of 76 percent in the total annual emission rate for the priority MSATs is projected for the same period.[10]

Per federal guidance, projects with no MSAT impacts generally include those that have no meaningful impacts on traffic volumes or vehicle mix.[11] Projects that have low potential MSAT effects are those that serve to improve highway, transit, or freight operations or movement without adding substantial new capacity, or do not create a facility that is likely to substantially increase emissions. Most projects fall into this category. This Project would not change the traffic mix nor create or significantly alter major roadways in the area. The magnitude of the EPA-projected reductions is so great, even after accounting for VMT increases associated with planned growth, that MSAT emissions in the County are likely to be lower in the future when compared to existing conditions. It should be noted that current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts from transportation projects in a way that would be useful to decision-makers. A discussion of incomplete or unavailable information is provided in 40 CFR 1502.22.

[9] https://www.epa.gov/national-air-toxics-assessment
[10] https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/
[11] Federal Highway Administration (2023) Updated Interim guidance update on mobile source air toxic analysis in NEPA documents. Available at https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/.

GREENHOUSE GAS EMISSIONS

Setting

The term greenhouse gas (GHG) is used to describe atmospheric gases that absorb solar radiation and subsequently emit radiation in the thermal infrared region of the energy spectrum, trapping heat in the Earth's atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor, among others. A growing body of research attributes long-term changes in temperature, precipitation, and other elements of Earth's climate to large increases in GHG emissions since the mid-nineteenth century, particularly from human activity related to fossil fuel combustion. Anthropogenic GHG emissions of particular interest include CO_2, CH_4, N_2O, and fluorinated gases.

GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO_2 is the most important GHG, so amounts of other gases are expressed relative to CO_2, using a metric called "carbon dioxide equivalent" (CO_2e). The global warming potential of CO_2 is assigned a value of 1, and the warming potential of other gases is assessed as multiples of CO_2. For example, the 2007 International Panel on Climate Change Fourth Assessment Report calculates the GWP of CH_4 as 25 and the GWP of N_2O as 298, over a 100-year time horizon. Generally, estimates of all GHGs are summed to obtain total emissions for a project or given period, usually expressed in metric tons ($MTCO_2e$), or million metric tons ($MMTCO_2e$).

As evidence has mounted for the relationship of climate changes to rising GHGs, federal and state governments have established numerous policies and goals targeted to improving energy efficiency and fuel economy and reducing GHG emissions. Nationally, electricity generation is the largest source of GHG emissions, followed by transportation. In California, however, transportation is the largest contributor to GHGs.

At the federal level, the National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to deciding on the action or project.

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. However, the U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) issued the first corporate fuel economy (CAFE) standards in 2010, requiring cars and light-duty vehicles to achieve certain fuel economy targets by 2016, with the intention of gradually increasing the targets and the range of vehicles to which they would apply.

California has enacted aggressive GHG reduction targets, starting with Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 is California's signature climate change legislation. It set the goal of reducing statewide GHG emissions to 1990 levels by 2020 and required CARB to develop a Scoping Plan that describes the approach California will take to achieve that goal and to update it every 5 years. In 2015, Governor Jerry Brown enhanced the overall adaptation planning effort with Executive Order (EO) B-30-15, establishing an interim

GHG reduction goal of 40 percent below 1990 levels by 2030, and requiring state agencies to factor climate change into all planning and investment decisions.

Senate Bill (SB) 375, the Sustainable Communities and Climate Protection Act of 2008, furthered state climate action goals by mandating coordinated transportation and land use planning through preparation of sustainable communities strategies (SCSs). The CARB sets GHG emissions reduction targets for passenger vehicles for each region. Each regional metropolitan planning organization (MPO) must include in its regional transportation plan SCSs proposing actions toward achieving the regional emissions reduction targets.

With these and other State Senate and Assembly bills and executive orders, California advances an innovative and proactive approach to dealing with GHG emissions and climate change.

Plan Bay Area

Assembly Bill (AB) 375 requires the Bay Area regional planning agencies to include SCSs in their regional transportation plan updates to describe how the GHG emissions reductions set by CARB would be met through land-use and transportation planning. In 2010, the MTC approved a set of "Bay Area Principles for Establishing Regional Greenhouse Gas Reduction Targets" (Resolution 3970) that proposed per-capita GHG emissions reductions of 7 percent from 1990 by 2020 and 15 percent by 2035. Subsequently, MTC, along with ABAG, developed SCS plans to meet state targets for reducing GHG emissions from light-duty vehicles. Plan Bay Area 2050 is the recently adopted RTP. It includes new and/or updated transportation projects and Climate Initiatives.[12] Plan Bay Area 2050 was adopted by both MTC and ABAG on October 21, 2021 and approved by the FHWA and Federal Transit Administration (FTA) on December 3, 2021.

The proposed Project, located in unincorporated Sonoma County, is included in the current RTP/SCS, *Plan Bay Area 2050*. *Plan Bay Area 2050* uses the base year of 2015 for the existing conditions, except for GHG emissions, where a 2005 baseline is once again used for the analysis of SB 375 greenhouse gas reduction targets. The plan also uses a 1990 baseline for analyzing consistency with SB 32, which calls for a statewide reduction of GHG emissions to 40 percent from 1990 levels by 2030.[13] *Plan Bay Area 2050* has established 2050 as the current RTP horizon year.

Federal and Statewide GHG Emissions

The EPA reported that in 2022, total gross nationwide GHG emissions were 6,343 million metric tons (MMT) carbon dioxide equivalent (CO_2e).[14] These emissions were lower than peak levels of 7,416 MMT that were emitted in 2007.

CO_2 accounted for 84% of California's total GHG emissions in 2015. Transportation, primarily on-road travel, is the single largest source of CO_2 emissions in the state.

[12] https://www.planbayarea.org/plan-bay-area-2050-1
[13] MTC and ABAG. 2021. Plan Bay Area 2050 Draft EIR. June.
[14] United States Environmental Protection Agency, 2025. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2022*. Web: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

MMTCO2e?

CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2012 emissions.[15] In 2012, GHG emissions from statewide emitting activities were 371.1 MMT. Per capita GHG emissions in California have dropped from a 2001 peak of 14.0 MMT per person to 9.3 MMT per person in 2022, a 33 percent decrease. They are also 9.3 MMT lower than 2021 emissions. The most recent Bay Area emission inventory was computed for the year 2011.[16] The Bay Area GHG emission were 87 MMT. As a point of comparison, statewide emissions were about 444 MMT in 2011.

Regional Climate Protection Authority

The Regional Climate Protection Authority (RCPA) was formed in 2009 to coordinate climate protection efforts among Sonoma County's nine cities and multiple agencies, including those of unincorporated Sonoma County. RCPA has developed a Climate Mobilization Strategy, identified climate hazards and vulnerabilities, and developed an action plan for local governments to facilitate a significant shift in transportation behavior in Sonoma County, a reduction in VMT, and an increase in electric vehicle use.

Sonoma County emissions in 2018 were 3.41 MMT CO_2e, slightly below 2015 emissions of 3.44 MMT CO_2e. Relative to 1990 emissions, 2018 emissions decreased by 13%. However, to meet the 2030 target of 40% below 1990 emissions (2.37 MMT CO_2e), Sonoma County must reduce emissions at a faster rate than it achieved between 1990 and 2018. Approximately 60% of total countywide emissions were from transportation in 2018. Between 2015 and 2018, vehicle miles traveled by residents and employees within the county increased by almost 10% or approximately 1 million miles per day. Emissions during this same time period increased by 3%. Emissions have risen at a lower rate than VMT due to improvements in fuel efficiency and a shift from fossil fuel vehicles to hybrid and electric vehicles.[17]

In 2016, the RCPA developed a regional climate action plan (*Climate Action 2020 and Beyond*). The Plan contains concrete actions to reduce GHG emissions countywide including:

- Reduce travel demand through focused growth
- Encourage a shift toward low-carbon transportation options
- Increase vehicle and equipment fuel efficiency
- Encourage a shift toward low-carbon fuels in vehicles and equipment
- Reduce idling

Through the implementation of more than 60 state, regional, and local reduction measures, Sonoma County plans to achieve the State mandated GHG emissions reduction targets; 40% by 2030 and by 80% by 2050.[18]

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[15] CARB. 2025. *2024 Edition, California Greenhouse Gas Emission Inventory: 2000 – 2022*. Web: https://ww2.arb.ca.gov/ghg-inventory-data

[16] BAAQMD. 2015. *Bay Area Emissions Inventory Summary Report: Greenhouse Gases Base Year 2011*. January. Web: http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf

[17] RCPA. 2020. Sonoma County Green House Gas Inventory 2018 Update. Web: https://scta.ca.gov/wp-content/uploads/2022/02/2018-GHG-Report-FINAL-9-25.pdf

[18] RCPA. 2016. Climate Action 2020 and Beyond. Web: https://rcpa.ca.gov/wp-content/uploads/2016/07/CA2020_Plan_7-7-16_web.pdf

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

GHG emissions associated with the proposed bridge replacement project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term operational emissions associated with vehicular traffic on the new bridge and redesigned roadway connections.

Construction Emissions

CalEEMod was used to predict GHG emissions from construction of the new bridge, demolition of the old one, and constructing the redesigned roadway connections as previously described in Impact AIR-1. CalEEMod outputs are included in *Attachment 1*.

GHG emissions associated with construction were estimated to be 1,145 MT of CO_2e for the 12-month construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the County nor NoSoCo Air District have an adopted threshold of significance for construction related GHG emissions, however, emissions are often quantified and disclosed for CEQA.

Operational Emissions

GHG emissions from the project would be generated primarily from traffic using the new bridge and roadway connections. This Project would not increase the VMT in the County, nor would it alter traffic speeds or volumes. Therefore, GHG emissions from operation of the Project are expected to be less than existing conditions due to newer, less polluting vehicles replacing older vehicles being operated in the County.

Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan. Vehicles using the new bridge would be subject to CARB emissions standards which are projected to reduce the amount of GHGs emitted in future. The project is included in *Plan Bay Area 2050* and its SCS goals and supports the goals of the region's climate action plan.

Supporting Documentation

Attachment 1 CalEEMod modeling assumptions and outputs for project construction criteria air pollutant and GHG emissions.

Attachment 2 Health Risk Analysis Materials. AERMOD files are voluminous and are available upon request in digital format.

Attachment 1: CalEEMod Modeling Output

Construction Inputs

Project	0.3	mi	3	ac	2656 CY import	550 CY demo	1925	CY	Concrete and asphalt	192.5 Deliveries	385 trips
											3.24
Bridge	0.1	mi	0.4	ac	1859 CY import	550 CY demo	1700	CY	Concrete		
Roadways	0.2	mi	2.6	ac	797 CY import	0 CY demo	225	CY	Asphalt		

ChalkHillRd Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	ChalkHillRd
Construction Start Date	4/1/2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	17.2
Location	38.622051437763645, -122.77375340089743
County	Sonoma-North Coast
City	Unincorporated
Air District	Northern Sonoma County APCD
Air Basin	North Coast
TAZ	888
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Bridge/Overpass Construction	0.10	Mile	0.40	0.00	—	—	—	—
Road Construction	0.20	Mile	2.60	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.67	5.63	44.7	59.6	0.12	2.02	2.97	4.99	1.86	0.38	2.24	—	12,966	12,966	0.53	0.15	1.94	13,025
Mit.	1.49	1.47	8.89	75.3	0.12	0.24	2.97	3.21	0.24	0.38	0.62	—	12,966	12,966	0.53	0.15	1.94	13,025
% Reduced	78%	74%	80%	-26%	—	88%	—	36%	87%	—	72%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.66	5.62	44.8	59.4	0.12	2.02	2.97	4.99	1.86	0.38	2.24	—	12,946	12,946	0.53	0.15	0.05	13,002
Mit.	2.00	1.83	12.1	75.2	0.12	0.44	2.97	3.21	0.42	0.38	0.73	—	12,946	12,946	0.53	0.15	0.05	13,002
% Reduced	70%	67%	73%	-27%	—	78%	—	36%	78%	—	68%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.97	2.50	20.1	26.3	0.05	0.88	1.33	2.21	0.81	0.17	0.98	—	5,782	5,782	0.23	0.07	0.42	5,810
Mit.	0.78	0.75	4.80	33.2	0.05	0.14	1.33	1.47	0.14	0.17	0.31	—	5,782	5,782	0.23	0.07	0.42	5,810
% Reduced	74%	70%	76%	-26%	—	84%	—	33%	83%	—	68%	—	—	—	—	—	—	—

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.54	0.46	3.67	4.79	0.01	0.16	0.24	0.40	0.15	0.03	0.18	—	957	957	0.04	0.01	0.07	962
Mit.	0.14	0.14	0.88	6.05	0.01	0.03	0.24	0.27	0.02	0.03	0.06	—	957	957	0.04	0.01	0.07	962
% Reduced	74%	70%	76%	-26%	—	84%	—	33%	83%	—	68%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.67	5.63	44.7	59.6	0.12	2.02	2.97	4.99	1.86	0.38	2.24	—	12,966	12,966	0.53	0.15	1.94	13,025
2028	1.12	0.95	9.00	15.7	0.02	0.31	0.22	0.53	0.28	0.06	0.34	—	2,618	2,618	0.10	0.06	0.92	2,639
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.66	5.62	44.8	59.4	0.12	2.02	2.97	4.99	1.86	0.38	2.24	—	12,946	12,946	0.53	0.15	0.05	13,002
2028	5.07	4.25	33.7	44.7	0.10	1.30	2.31	3.61	1.20	0.31	1.51	—	10,353	10,353	0.42	0.13	0.04	10,402
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	2.97	2.50	20.1	26.3	0.05	0.88	1.33	2.21	0.81	0.17	0.98	—	5,782	5,782	0.23	0.07	0.42	5,810
2028	0.52	0.44	3.62	5.21	0.01	0.14	0.20	0.34	0.12	0.03	0.15	—	1,097	1,097	0.04	0.02	0.10	1,103
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.54	0.46	3.67	4.79	0.01	0.16	0.24	0.40	0.15	0.03	0.18	—	957	957	0.04	0.01	0.07	962
2028	0.09	0.08	0.66	0.95	< 0.005	0.02	0.04	0.06	0.02	0.01	0.03	—	182	182	0.01	< 0.005	0.02	183

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.49	1.47	8.89	75.3	0.12	0.24	2.97	3.21	0.24	0.38	0.62	—	12,966	12,966	0.53	0.15	1.94	13,025
2028	0.33	0.32	2.04	16.7	0.02	0.05	0.22	0.27	0.05	0.06	0.10	—	2,618	2,618	0.10	0.06	0.92	2,639
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	2.00	1.83	12.1	75.2	0.12	0.44	2.97	3.21	0.42	0.38	0.73	—	12,946	12,946	0.53	0.15	0.05	13,002
2028	1.97	1.80	11.9	57.7	0.10	0.42	2.31	2.74	0.40	0.31	0.71	—	10,353	10,353	0.42	0.13	0.04	10,402
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.78	0.75	4.80	33.2	0.05	0.14	1.33	1.47	0.14	0.17	0.31	—	5,782	5,782	0.23	0.07	0.42	5,810
2028	0.19	0.18	1.15	6.34	0.01	0.04	0.20	0.24	0.04	0.03	0.07	—	1,097	1,097	0.04	0.02	0.10	1,103
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.14	0.14	0.88	6.05	0.01	0.03	0.24	0.27	0.02	0.03	0.06	—	957	957	0.04	0.01	0.07	962
2028	0.03	0.03	0.21	1.16	< 0.005	0.01	0.04	0.04	0.01	0.01	0.01	—	182	182	0.01	< 0.005	0.02	183

3. Construction Emissions Details

3.1. Linear, Grubbing & Land Clearing (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	6.80	7.92	0.01	0.35	—	0.35	0.32	—	0.32	—	1,123	1,123	0.05	0.01	—	1,127

Dust From Material Movement	—	—	—	—	—	—	0.41	0.41	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.48	0.56	< 0.005	0.02	—	0.02	0.02	—	0.02	—	80.0	80.0	< 0.005	< 0.005	—	80.3
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.09	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.2	13.2	< 0.005	< 0.005	—	13.3
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.66	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	105	105	0.01	< 0.005	0.40	107

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.01	0.57	0.08	< 0.005	0.01	0.12	0.12	0.01	0.03	0.04	—	431	431	< 0.005	0.07	0.70	452
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.23	7.23	< 0.005	< 0.005	0.01	7.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.7	30.7	< 0.005	< 0.005	0.02	32.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.20	1.20	< 0.005	< 0.005	< 0.005	1.22
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.08	5.08	< 0.005	< 0.005	< 0.005	5.33

3.2. Linear, Grubbing & Land Clearing (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.13	2.33	7.85	0.01	0.02	—	0.02	0.02	—	0.02	—	1,123	1,123	0.05	0.01	—	1,127
Dust From Material Movement	—	—	—	—	—	—	0.41	0.41	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.17	0.56	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	80.0	80.0	< 0.005	< 0.005	—	80.3
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.2	13.2	< 0.005	< 0.005	—	13.3
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.66	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	105	105	0.01	< 0.005	0.40	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.01	0.57	0.08	< 0.005	0.01	0.12	0.12	0.01	0.03	0.04	—	431	431	< 0.005	0.07	0.70	452
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.23	7.23	< 0.005	< 0.005	0.01	7.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.7	30.7	< 0.005	< 0.005	0.02	32.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.20	1.20	< 0.005	< 0.005	< 0.005	1.22
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.08	5.08	< 0.005	< 0.005	< 0.005	5.33

3.3. Linear, Grading & Excavation (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	6.38	5.36	44.3	56.9	0.11	2.02	—	2.02	1.86	—	1.86	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	6.38	5.36	44.3	56.9	0.11	2.02	—	2.02	1.86	—	1.86	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.08	1.75	14.4	18.5	0.04	0.66	—	0.66	0.61	—	0.61	—	4,031	4,031	0.16	0.03	—	4,045
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.09	0.09	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.38	0.32	2.63	3.38	0.01	0.12	—	0.12	0.11	—	0.11	—	667	667	0.03	0.01	—	670
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.26	0.20	2.66	0.00	0.00	0.41	0.41	0.00	0.10	0.10	—	420	420	0.02	0.02	1.62	428
Vendor	< 0.005	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	51.2	51.2	< 0.005	0.01	0.12	53.5
Hauling	< 0.005	< 0.005	0.17	0.03	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	130	130	< 0.005	0.02	0.21	136
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.25	0.24	2.50	0.00	0.00	0.41	0.41	0.00	0.10	0.10	—	399	399	0.03	0.02	0.04	405
Vendor	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	51.3	51.3	< 0.005	0.01	< 0.005	53.5
Hauling	< 0.005	< 0.005	0.18	0.03	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	130	130	< 0.005	0.02	0.01	136
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.07	0.81	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	132	132	0.01	0.01	0.23	135
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.02	17.4
Hauling	< 0.005	< 0.005	0.06	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.3	42.3	< 0.005	0.01	0.03	44.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	21.9	21.9	< 0.005	< 0.005	0.04	22.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.77	2.77	< 0.005	< 0.005	< 0.005	2.89
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.01	7.01	< 0.005	< 0.005	< 0.005	7.35

3.4. Linear, Grading & Excavation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	1.20	1.20	8.46	72.6	0.11	0.23	—	0.23	0.23	—	0.23	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	1.20	8.46	72.6	0.11	0.23	—	0.23	0.23	—	0.23	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	0.39	2.76	23.7	0.04	0.08	—	0.08	0.08	—	0.08	—	4,031	4,031	0.16	0.03	—	4,045
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.09	0.09	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.07	0.50	4.32	0.01	0.01	—	0.01	0.01	—	0.01	—	667	667	0.03	0.01	—	670
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.26	0.20	2.66	0.00	0.00	0.41	0.41	0.00	0.10	0.10	—	420	420	0.02	0.02	1.62	428
Vendor	< 0.005	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	51.2	51.2	< 0.005	0.01	0.12	53.5
Hauling	< 0.005	< 0.005	0.17	0.03	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	130	130	< 0.005	0.02	0.21	136
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.25	0.24	2.50	0.00	0.00	0.41	0.41	0.00	0.10	0.10	—	399	399	0.03	0.02	0.04	405
Vendor	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	51.3	51.3	< 0.005	0.01	< 0.005	53.5
Hauling	< 0.005	< 0.005	0.18	0.03	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	130	130	< 0.005	0.02	0.01	136
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.07	0.81	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	132	132	0.01	0.01	0.23	135
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.02	17.4
Hauling	< 0.005	< 0.005	0.06	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.3	42.3	< 0.005	0.01	0.03	44.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.02	0.01	0.01	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	21.9	21.9	< 0.005	< 0.005	0.04	22.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.77	2.77	< 0.005	< 0.005	< 0.005	2.89
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.01	7.01	< 0.005	< 0.005	< 0.005	7.35

3.5. Linear, Drainage, Utilities, & Sub-Grade (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.97	4.17	35.3	42.7	0.09	1.40	—	1.40	1.29	—	1.29	—	9,768	9,768	0.40	0.08	—	9,802
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	0.58	4.91	5.93	0.01	0.20	—	0.20	0.18	—	0.18	—	1,357	1,357	0.06	0.01	—	1,362
Dust From Material Movement	—	—	—	—	—	—	0.26	0.26	—	0.03	0.03	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.90	1.08	< 0.005	0.04	—	0.04	0.03	—	0.03	—	225	225	0.01	< 0.005	—	225
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.24	0.23	2.38	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	379	379	0.03	0.02	0.04	385
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.30	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	219	219	< 0.005	0.04	0.01	229
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.33	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	53.6	53.6	< 0.005	< 0.005	0.09	54.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.4	30.4	< 0.005	< 0.005	0.02	31.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.88	8.88	< 0.005	< 0.005	0.02	9.02
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.03	5.03	< 0.005	< 0.005	< 0.005	5.27

3.6. Linear, Drainage, Utilities, & Sub-Grade (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.74	1.59	11.6	55.5	0.09	0.43	—	0.43	0.41	—	0.41	—	9,768	9,768	0.40	0.08	—	9,802
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.22	1.61	7.71	0.01	0.06	—	0.06	0.06	—	0.06	—	1,357	1,357	0.06	0.01	—	1,362
Dust From Material Movement	—	—	—	—	—	—	0.26	0.26	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.04	0.04	0.29	1.41	< 0.005	0.01	—	0.01	0.01	—	0.01	—	225	225	0.01	< 0.005	—	225
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.24	0.23	2.38	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	379	379	0.03	0.02	0.04	385
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.30	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	219	219	< 0.005	0.04	0.01	229
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.33	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	53.6	53.6	< 0.005	< 0.005	0.09	54.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.4	30.4	< 0.005	< 0.005	0.02	31.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.88	8.88	< 0.005	< 0.005	0.02	9.02
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.03	5.03	< 0.005	< 0.005	< 0.005	5.27

3.7. Linear, Drainage, Utilities, & Sub-Grade (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.81	4.03	33.2	42.5	0.09	1.30	—	1.30	1.19	—	1.19	—	9,768	9,768	0.40	0.08	—	9,801
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.38	0.32	2.60	3.33	0.01	0.10	—	0.10	0.09	—	0.09	—	765	765	0.03	0.01	—	767
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.47	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	127	127	0.01	< 0.005	—	127

Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.22	0.20	2.21	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	372	372	0.02	0.02	0.04	378
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.29	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	213	213	< 0.005	0.03	0.01	223
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.17	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.7	29.7	< 0.005	< 0.005	0.05	30.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.01	17.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.91	4.91	< 0.005	< 0.005	0.01	4.99
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.76	2.76	< 0.005	< 0.005	< 0.005	2.89

3.8. Linear, Drainage, Utilities, & Sub-Grade (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.72	1.57	11.4	55.5	0.09	0.42	—	0.42	0.40	—	0.40	—	9,768	9,768	0.40	0.08	—	9,801
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.12	0.89	4.34	0.01	0.03	—	0.03	0.03	—	0.03	—	765	765	0.03	0.01	—	767
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.16	0.79	< 0.005	0.01	—	0.01	0.01	—	0.01	—	127	127	0.01	< 0.005	—	127
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.22	0.20	2.21	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	372	372	0.02	0.02	0.04	378
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.29	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	213	213	< 0.005	0.03	0.01	223
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.17	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.7	29.7	< 0.005	< 0.005	0.05	30.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.01	17.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.91	4.91	< 0.005	< 0.005	0.01	4.99
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.76	2.76	< 0.005	< 0.005	< 0.005	2.89

3.9. Linear, Paving (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.01	0.85	8.66	14.7	0.02	0.30	—	0.30	0.28	—	0.28	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	8.66	14.7	0.02	0.30	—	0.30	0.28	—	0.28	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.95	1.61	< 0.005	0.03	—	0.03	0.03	—	0.03	—	246	246	0.01	< 0.005	—	246
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.29	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.6	40.6	< 0.005	< 0.005	—	40.8
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.07	0.99	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	165	165	0.01	0.01	0.59	168
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.01	0.01	0.28	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	213	213	< 0.005	0.03	0.32	223
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.09	0.93	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	157	157	0.01	0.01	0.02	159
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.29	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	213	213	< 0.005	0.03	0.01	223
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.03	17.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.03	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	23.3	23.3	< 0.005	< 0.005	0.02	24.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.89	2.89	< 0.005	< 0.005	< 0.005	2.94
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.86	3.86	< 0.005	< 0.005	< 0.005	4.05

3.10. Linear, Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.22	1.70	15.7	0.02	0.04	—	0.04	0.04	—	0.04	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.22	1.70	15.7	0.02	0.04	—	0.04	0.04	—	0.04	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.19	1.72	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	246	246	0.01	< 0.005	—	246
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	40.6	40.6	< 0.005	< 0.005	—	40.8
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.07	0.99	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	165	165	0.01	0.01	0.59	168
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.01	0.28	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	213	213	< 0.005	0.03	0.32	223
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.09	0.93	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	157	157	0.01	0.01	0.02	159

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.29	0.04	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	213	213	< 0.005	0.03	0.01	223
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.03	17.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.03	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	23.3	23.3	< 0.005	< 0.005	0.02	24.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.89	2.89	< 0.005	< 0.005	< 0.005	2.94
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.86	3.86	< 0.005	< 0.005	< 0.005	4.05

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Linear, Grubbing & Land Clearing	Linear, Grubbing & Land Clearing	4/1/2027	5/7/2027	5.00	26.0	—
Linear, Grading & Excavation	Linear, Grading & Excavation	5/8/2027	10/21/2027	5.00	119	—
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	10/22/2027	2/9/2028	5.00	79.0	—
Linear, Paving	Linear, Paving	2/10/2028	4/6/2028	5.00	40.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43

Linear, Grubbing & Land Clearing	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Cranes	Diesel	Average	1.00	8.00	367	0.29
Linear, Grading & Excavation	Crawler Tractors	Diesel	Average	3.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Graders	Diesel	Average	3.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Average	3.00	8.00	150	0.36
Linear, Grading & Excavation	Scrapers	Diesel	Average	3.00	8.00	423	0.48
Linear, Grading & Excavation	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Average	2.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	3.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Average	2.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Average	2.00	8.00	96.0	0.40

Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Average	3.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Linear, Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Paving	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Tier 4 Final	2.00	8.00	87.0	0.43
Linear, Grubbing & Land Clearing	Excavators	Diesel	Tier 4 Final	3.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
Linear, Grading & Excavation	Crawler Tractors	Diesel	Tier 4 Final	3.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Tier 4 Final	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Graders	Diesel	Tier 4 Final	3.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Tier 4 Final	3.00	8.00	150	0.36

Linear, Grading & Excavation	Scrapers	Diesel	Tier 4 Final	3.00	8.00	423	0.48
Linear, Grading & Excavation	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Tier 4 Final	2.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	1.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Tier 4 Final	2.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Average	2.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Tier 4 Final	2.00	8.00	96.0	0.40
Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Tier 4 Final	3.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Tier 4 Final	2.00	8.00	81.0	0.42
Linear, Paving	Paving Equipment	Diesel	Tier 4 Final	2.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
Linear, Paving	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	12.5	11.7	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	8.40	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	6.38	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	50.0	11.7	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	2.00	8.40	HHDT,MHDT
Linear, Grading & Excavation	Hauling	1.92	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	47.5	11.7	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	8.40	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	3.24	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	20.0	11.7	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	8.40	HHDT,MHDT
Linear, Paving	Hauling	3.24	20.0	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	12.5	11.7	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	8.40	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	6.38	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	50.0	11.7	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	2.00	8.40	HHDT,MHDT
Linear, Grading & Excavation	Hauling	1.92	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	47.5	11.7	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	8.40	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	3.24	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	20.0	11.7	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	8.40	HHDT,MHDT
Linear, Paving	Hauling	3.24	20.0	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Linear, Grubbing & Land Clearing	1,328	—	3.00	0.00	—
Linear, Grading & Excavation	1,328	—	3.00	5,440	—
Linear, Drainage, Utilities, & Sub-Grade	—	—	3.00	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	204	0.03	< 0.005
2028	0.00	204	0.03	< 0.005

Average Daily (lbs/day)

				ROG	NOx	CO	PM10T	PM2.5T	CO_2e
2027				2.50	20.09	26.25	2.21	0.98	961.85
Grubbing & Land Clearing	4/1/2027	5/7/2027	26	2.98	23.87	31.20	2.63	1.17	181.22
Grading & Excavation	5/8/2027	10/1/2027	112	2.03	16.30	21.31	1.80	0.80	780.63
			138	2.50	20.09	26.25	2.21	0.98	961.85
2028				0.44	3.62	5.21	0.34	0.15	182.67
Linear, Drainage, Utilities, & Sub-Gra	5/1/2028	8/14/2028	86	0.30	2.47	3.56	0.23	0.11	124.68
Linear, Paving	8/15/2028	10/1/2028	40	0.58	4.77	6.87	0.45	0.20	57.99
			126	0.44	3.62	5.21	0.34	0.15	182.67
Total (tons)				0.54	4.33	5.74	0.28	0.21	1,144.52
Average Workday Emissions (lbs/day)			264	4.07	32.79	43.50	2.13	1.58	1,144.52

Attachment 2: Health Risk Calculations for Construction

ChalkHillRd_HalfMile Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	ChalkHillRd_HalfMile
Construction Start Date	4/1/2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	17.2
Location	38.622051437763645, -122.77375340089743
County	Sonoma-North Coast
City	Unincorporated
Air District	Northern Sonoma County APCD
Air Basin	North Coast
TAZ	888
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Bridge/Overpass Construction	0.10	Mile	0.40	0.00	—	—	—	—
Road Construction	0.20	Mile	2.60	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.61	5.59	44.4	57.5	0.11	2.02	2.53	4.55	1.86	0.28	2.13	—	12,403	12,403	0.51	0.11	0.08	12,448
Mit.	1.43	1.43	8.56	73.3	0.11	0.23	2.53	2.76	0.23	0.28	0.51	—	12,403	12,403	0.51	0.11	0.08	12,448
% Reduced	78%	74%	81%	-27%	—	88%	—	39%	87%	—	76%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.61	5.58	44.4	57.7	0.11	2.02	2.53	4.55	1.86	0.28	2.13	—	12,402	12,402	0.52	0.11	< 0.005	12,447
Mit.	1.95	1.80	11.7	73.5	0.11	0.43	2.53	2.76	0.41	0.28	0.62	—	12,402	12,402	0.52	0.11	< 0.005	12,447
% Reduced	70%	68%	74%	-27%	—	79%	—	39%	78%	—	71%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.94	2.49	19.9	25.4	0.05	0.88	1.12	1.99	0.81	0.12	0.93	—	5,488	5,488	0.23	0.05	0.02	5,508
Mit.	0.75	0.73	4.59	32.3	0.05	0.14	1.12	1.25	0.13	0.12	0.26	—	5,488	5,488	0.23	0.05	0.02	5,508
% Reduced	75%	71%	77%	-27%	—	84%	—	37%	83%	—	72%	—	—	—	—	—	—	—

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.54	0.45	3.63	4.63	0.01	0.16	0.20	0.36	0.15	0.02	0.17	—	909	909	0.04	0.01	< 0.005	912
Mit.	0.14	0.13	0.84	5.90	0.01	0.03	0.20	0.23	0.02	0.02	0.05	—	909	909	0.04	0.01	< 0.005	912
% Reduced	75%	71%	77%	-27%	—	84%	—	37%	83%	—	72%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.61	5.59	44.4	57.5	0.11	2.02	2.53	4.55	1.86	0.28	2.13	—	12,403	12,403	0.51	0.11	0.08	12,448
2028	1.10	0.94	8.73	14.9	0.02	0.30	0.01	0.31	0.28	< 0.005	0.28	—	2,261	2,261	0.10	0.02	0.03	2,270
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.61	5.58	44.4	57.7	0.11	2.02	2.53	4.55	1.86	0.28	2.13	—	12,402	12,402	0.52	0.11	< 0.005	12,447
2028	5.02	4.23	33.3	43.3	0.09	1.30	1.88	3.18	1.19	0.21	1.40	—	9,802	9,802	0.41	0.09	< 0.005	9,838
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	2.94	2.49	19.9	25.4	0.05	0.88	1.12	1.99	0.81	0.12	0.93	—	5,488	5,488	0.23	0.05	0.02	5,508
2028	0.51	0.43	3.56	5.02	0.01	0.13	0.15	0.28	0.12	0.02	0.14	—	1,015	1,015	0.04	0.01	< 0.005	1,019
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.54	0.45	3.63	4.63	0.01	0.16	0.20	0.36	0.15	0.02	0.17	—	909	909	0.04	0.01	< 0.005	912
2028	0.09	0.08	0.65	0.92	< 0.005	0.02	0.03	0.05	0.02	< 0.005	0.03	—	168	168	0.01	< 0.005	< 0.005	169

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.43	1.43	8.56	73.3	0.11	0.23	2.53	2.76	0.23	0.28	0.51	—	12,403	12,403	0.51	0.11	0.08	12,448
2028	0.31	0.31	1.77	16.0	0.02	0.04	0.01	0.05	0.04	< 0.005	0.04	—	2,261	2,261	0.10	0.02	0.03	2,270
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.95	1.80	11.7	73.5	0.11	0.43	2.53	2.76	0.41	0.28	0.62	—	12,402	12,402	0.52	0.11	< 0.005	12,447
2028	1.92	1.77	11.5	56.3	0.09	0.42	1.88	2.30	0.40	0.21	0.60	—	9,802	9,802	0.41	0.09	< 0.005	9,838
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.75	0.73	4.59	32.3	0.05	0.14	1.12	1.25	0.13	0.12	0.26	—	5,488	5,488	0.23	0.05	0.02	5,508
2028	0.18	0.17	1.09	6.15	0.01	0.04	0.15	0.19	0.04	0.02	0.05	—	1,015	1,015	0.04	0.01	< 0.005	1,019
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.14	0.13	0.84	5.90	0.01	0.03	0.20	0.23	0.02	0.02	0.05	—	909	909	0.04	0.01	< 0.005	912
2028	0.03	0.03	0.20	1.12	< 0.005	0.01	0.03	0.03	0.01	< 0.005	0.01	—	168	168	0.01	< 0.005	< 0.005	169

3. Construction Emissions Details

3.1. Linear, Grubbing & Land Clearing (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	6.80	7.92	0.01	0.35	—	0.35	0.32	—	0.32	—	1,123	1,123	0.05	0.01	—	1,127

Dust From Material Movement	—	—	—	—	—	—	0.41	0.41	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.48	0.56	< 0.005	0.02	—	0.02	0.02	—	0.02	—	80.0	80.0	< 0.005	< 0.005	—	80.3
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.09	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.2	13.2	< 0.005	< 0.005	—	13.3
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.01	0.15	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	6.64	6.64	< 0.005	< 0.005	0.02	7.10

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.06	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	20.5	20.5	< 0.005	< 0.005	0.02	21.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.47	0.47	< 0.005	< 0.005	< 0.005	0.50
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.46	1.46	< 0.005	< 0.005	< 0.005	1.53
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25

3.2. Linear, Grubbing & Land Clearing (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.13	2.33	7.85	0.01	0.02	—	0.02	0.02	—	0.02	—	1,123	1,123	0.05	0.01	—	1,127
Dust From Material Movement	—	—	—	—	—	—	0.41	0.41	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.17	0.56	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	80.0	80.0	< 0.005	< 0.005	—	80.3
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.2	13.2	< 0.005	< 0.005	—	13.3
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.01	0.15	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	6.64	6.64	< 0.005	< 0.005	0.02	7.10
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.06	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	20.5	20.5	< 0.005	< 0.005	0.02	21.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.47	0.47	< 0.005	< 0.005	< 0.005	0.50
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.46	1.46	< 0.005	< 0.005	< 0.005	1.53
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25

3.3. Linear, Grading & Excavation (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	6.38	5.36	44.3	56.9	0.11	2.02	—	2.02	1.86	—	1.86	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	6.38	5.36	44.3	56.9	0.11	2.02	—	2.02	1.86	—	1.86	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.08	1.75	14.4	18.5	0.04	0.66	—	0.66	0.61	—	0.61	—	4,031	4,031	0.16	0.03	—	4,045
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.09	0.09	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.38	0.32	2.63	3.38	0.01	0.12	—	0.12	0.11	—	0.11	—	667	667	0.03	0.01	—	670
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.22	0.05	0.61	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	26.6	26.6	0.01	< 0.005	0.07	28.4
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.95	4.95	< 0.005	< 0.005	0.01	5.17
Hauling	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.17	6.17	< 0.005	< 0.005	0.01	6.47
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.21	0.06	0.84	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	26.1	26.1	0.01	< 0.005	< 0.005	28.0
Vendor	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.98	4.98	< 0.005	< 0.005	< 0.005	5.20
Hauling	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.23	6.23	< 0.005	< 0.005	< 0.005	6.53
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.02	0.23	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.54	8.54	< 0.005	< 0.005	0.01	9.13
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.62	1.62	< 0.005	< 0.005	< 0.005	1.69
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.02	2.02	< 0.005	< 0.005	< 0.005	2.12
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.04	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.41	1.41	< 0.005	< 0.005	< 0.005	1.51
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.27	0.27	< 0.005	< 0.005	< 0.005	0.28
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.35

3.4. Linear, Grading & Excavation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	1.20	1.20	8.46	72.6	0.11	0.23	—	0.23	0.23	—	0.23	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	1.20	8.46	72.6	0.11	0.23	—	0.23	0.23	—	0.23	—	12,365	12,365	0.50	0.10	—	12,408
Dust From Material Movement	—	—	—	—	—	—	2.48	2.48	—	0.27	0.27	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	0.39	2.76	23.7	0.04	0.08	—	0.08	0.08	—	0.08	—	4,031	4,031	0.16	0.03	—	4,045
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.09	0.09	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.07	0.50	4.32	0.01	0.01	—	0.01	0.01	—	0.01	—	667	667	0.03	0.01	—	670
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.22	0.05	0.61	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	26.6	26.6	0.01	< 0.005	0.07	28.4
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.95	4.95	< 0.005	< 0.005	0.01	5.17
Hauling	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.17	6.17	< 0.005	< 0.005	0.01	6.47
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.21	0.06	0.84	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	26.1	26.1	0.01	< 0.005	< 0.005	28.0
Vendor	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.98	4.98	< 0.005	< 0.005	< 0.005	5.20
Hauling	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.23	6.23	< 0.005	< 0.005	< 0.005	6.53
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.02	0.23	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.54	8.54	< 0.005	< 0.005	0.01	9.13
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.62	1.62	< 0.005	< 0.005	< 0.005	1.69
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.02	2.02	< 0.005	< 0.005	< 0.005	2.12
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	< 0.005	0.04	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.41	1.41	< 0.005	< 0.005	< 0.005	1.51
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.27	0.27	< 0.005	< 0.005	< 0.005	0.28
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.35

3.5. Linear, Drainage, Utilities, & Sub-Grade (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.97	4.17	35.3	42.7	0.09	1.40	—	1.40	1.29	—	1.29	—	9,768	9,768	0.40	0.08	—	9,802
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	0.58	4.91	5.93	0.01	0.20	—	0.20	0.18	—	0.18	—	1,357	1,357	0.06	0.01	—	1,362
Dust From Material Movement	—	—	—	—	—	—	0.26	0.26	—	0.03	0.03	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.90	1.08	< 0.005	0.04	—	0.04	0.03	—	0.03	—	225	225	0.01	< 0.005	—	225
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.20	0.05	0.80	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	24.8	24.8	0.01	< 0.005	< 0.005	26.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	< 0.005	11.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.01	0.09	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.70
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.45	1.45	< 0.005	< 0.005	< 0.005	1.52
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25

3.6. Linear, Drainage, Utilities, & Sub-Grade (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.74	1.59	11.6	55.5	0.09	0.43	—	0.43	0.41	—	0.41	—	9,768	9,768	0.40	0.08	—	9,802
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.22	1.61	7.71	0.01	0.06	—	0.06	0.06	—	0.06	—	1,357	1,357	0.06	0.01	—	1,362
Dust From Material Movement	—	—	—	—	—	—	0.26	0.26	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.04	0.04	0.29	1.41	< 0.005	0.01	—	0.01	0.01	—	0.01	—	225	225	0.01	< 0.005	—	225
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.20	0.05	0.80	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	24.8	24.8	0.01	< 0.005	< 0.005	26.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	< 0.005	11.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.01	0.09	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.70
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.45	1.45	< 0.005	< 0.005	< 0.005	1.52
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25

3.7. Linear, Drainage, Utilities, & Sub-Grade (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.81	4.03	33.2	42.5	0.09	1.30	—	1.30	1.19	—	1.19	—	9,768	9,768	0.40	0.08	—	9,801
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.38	0.32	2.60	3.33	0.01	0.10	—	0.10	0.09	—	0.09	—	765	765	0.03	0.01	—	767
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.47	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	127	127	0.01	< 0.005	—	127

Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.19	0.05	0.74	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	24.3	24.3	0.01	< 0.005	< 0.005	26.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.3	10.3	< 0.005	< 0.005	< 0.005	10.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	< 0.005	0.05	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.91	1.91	< 0.005	< 0.005	< 0.005	2.04
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.80	0.80	< 0.005	< 0.005	< 0.005	0.84
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	0.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.13	0.13	< 0.005	< 0.005	< 0.005	0.14

3.8. Linear, Drainage, Utilities, & Sub-Grade (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.72	1.57	11.4	55.5	0.09	0.42	—	0.42	0.40	—	0.40	—	9,768	9,768	0.40	0.08	—	9,801
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.12	0.89	4.34	0.01	0.03	—	0.03	0.03	—	0.03	—	765	765	0.03	0.01	—	767
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.16	0.79	< 0.005	0.01	—	0.01	0.01	—	0.01	—	127	127	0.01	< 0.005	—	127
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.19	0.05	0.74	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	24.3	24.3	0.01	< 0.005	< 0.005	26.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.3	10.3	< 0.005	< 0.005	< 0.005	10.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	< 0.005	0.05	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.91	1.91	< 0.005	< 0.005	< 0.005	2.04
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.80	0.80	< 0.005	< 0.005	< 0.005	0.84
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	0.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.13	0.13	< 0.005	< 0.005	< 0.005	0.14

3.9. Linear, Paving (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.01	0.85	8.66	14.7	0.02	0.30	—	0.30	0.28	—	0.28	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	8.66	14.7	0.02	0.30	—	0.30	0.28	—	0.28	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.95	1.61	< 0.005	0.03	—	0.03	0.03	—	0.03	—	246	246	0.01	< 0.005	—	246
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.29	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.6	40.6	< 0.005	< 0.005	—	40.8
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.02	0.23	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.4	10.4	< 0.005	< 0.005	0.03	11.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.01	10.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.02	0.31	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.2	10.2	0.01	< 0.005	< 0.005	11.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.3	10.3	< 0.005	< 0.005	< 0.005	10.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.20
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.17
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.20
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19

3.10. Linear, Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.22	1.70	15.7	0.02	0.04	—	0.04	0.04	—	0.04	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.22	1.70	15.7	0.02	0.04	—	0.04	0.04	—	0.04	—	2,240	2,240	0.09	0.02	—	2,248
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.19	1.72	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	246	246	0.01	< 0.005	—	246
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	40.6	40.6	< 0.005	< 0.005	—	40.8
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.02	0.23	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.4	10.4	< 0.005	< 0.005	0.03	11.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.01	10.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.02	0.31	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.2	10.2	0.01	< 0.005	< 0.005	11.0

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.3	10.3	< 0.005	< 0.005	< 0.005	10.8
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.20
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.17
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.20
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Linear, Grubbing & Land Clearing	Linear, Grubbing & Land Clearing	4/1/2027	5/7/2027	5.00	26.0	—
Linear, Grading & Excavation	Linear, Grading & Excavation	5/8/2027	10/21/2027	5.00	119	—
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	10/22/2027	2/9/2028	5.00	79.0	—
Linear, Paving	Linear, Paving	2/10/2028	4/6/2028	5.00	40.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43

Linear, Grubbing & Land Clearing	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Cranes	Diesel	Average	1.00	8.00	367	0.29
Linear, Grading & Excavation	Crawler Tractors	Diesel	Average	3.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Graders	Diesel	Average	3.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Average	3.00	8.00	150	0.36
Linear, Grading & Excavation	Scrapers	Diesel	Average	3.00	8.00	423	0.48
Linear, Grading & Excavation	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Average	2.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	3.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Average	2.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Average	2.00	8.00	96.0	0.40

Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Average	3.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Linear, Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Paving	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Tier 4 Final	2.00	8.00	87.0	0.43
Linear, Grubbing & Land Clearing	Excavators	Diesel	Tier 4 Final	3.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
Linear, Grading & Excavation	Crawler Tractors	Diesel	Tier 4 Final	3.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Tier 4 Final	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Graders	Diesel	Tier 4 Final	3.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Tier 4 Final	3.00	8.00	150	0.36

Linear, Grading & Excavation	Scrapers	Diesel	Tier 4 Final	3.00	8.00	423	0.48
Linear, Grading & Excavation	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Tier 4 Final	2.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	1.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Tier 4 Final	2.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Average	2.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Tier 4 Final	2.00	8.00	96.0	0.40
Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Tier 4 Final	3.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Tier 4 Final	2.00	8.00	81.0	0.42
Linear, Paving	Paving Equipment	Diesel	Tier 4 Final	2.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
Linear, Paving	Signal Boards	Electric	Average	0.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	12.5	0.50	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	0.50	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	6.38	0.50	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	50.0	0.50	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	2.00	0.50	HHDT,MHDT
Linear, Grading & Excavation	Hauling	1.92	0.50	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	47.5	0.50	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	0.50	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	3.24	0.50	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	20.0	0.50	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	0.50	HHDT,MHDT
Linear, Paving	Hauling	3.24	0.50	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	12.5	0.50	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	0.50	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	6.38	0.50	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	50.0	0.50	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	2.00	0.50	HHDT,MHDT
Linear, Grading & Excavation	Hauling	1.92	0.50	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	47.5	0.50	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	0.50	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	3.24	0.50	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	20.0	0.50	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	0.50	HHDT,MHDT
Linear, Paving	Hauling	3.24	0.50	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Linear, Grubbing & Land Clearing	1,328	—	3.00	0.00	—
Linear, Grading & Excavation	1,328	—	3.00	5,440	—
Linear, Drainage, Utilities, & Sub-Grade	—	—	3.00	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	204	0.03	< 0.005
2028	0.00	204	0.03	< 0.005

Chalk Hill Road Bridge Construction

DPM Emissions and Modeling Emission Rates - Average Fleet

Construction Year	Activity	Source	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2027	***Construction***	DPM_CONST	0.0966	Point	484	193.2	0.12198	1.54E-02	3.18E-05
2028	***Construction***	DPM_CONST	0.0882	Point	484	176.4	0.11138	1.40E-02	2.90E-05

Construction Hours

Weekday hr/day =	12	(7am - 7pm)
days/yr =	132	
hours/year =	1584	

DPM Emissions and Modeling Emission Rates - Tier 4 Final

Construction Year	Activity	Source	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2027	***Construction***	DPM_CONST	0.0167	Point	484	33.4	0.02109	2.66E-03	5.49E-06
2028	***Construction***	DPM_CONST	0.0152	Point	484	30.5	0.01925	2.43E-03	5.01E-06

Construction Hours

Weekday hr/day =	12	(7am - 7pm)
days/yr =	132	
hours/year =	1584	

Chalk hill Road Bridge Replacemnt - Construction Impacts
Maximum DPM Cancer Risk
Impacts at Off-Site Residential Receptors - 1.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Exposure Information				Infant/Child	Adult			Adult	
			DPM Conc (ug/m3)		Age	Cancer	Modeled DPM Conc (ug/m3)		Age	Cancer	
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	
0	0.25	-0.25 - 0*	2027	0.1061	10	1.44					**HI**
1	1	0 - 1	2027	0.1061	10	17.43	2027	0.1061	1	0.305	0.021
2	1	1 - 2	2028	0.0969	10	15.91	2028	0.0969	1	0.278	0.019
3	1	2 - 3	2029	0.0000	3	0.00	2029	0.0000	1	0.000	0.000
4	1	3 - 4	2030	0.0000	3	0.00	2030	0.0000	1	0.000	0.000
5	1	4 - 5	2031	0.0000	3	0.00	2031	0.0000	1	0.000	0.000
6	1	5 - 6	2032	0.0000	3	0.00	2032	0.0000	1	0.00	
7	1	6 - 7	2033	0.0000	3	0.00	2033	0.0000	1	0.00	
8	1	7 - 8	2034	0.0000	3	0.00	2034	0.0000	1	0.00	
9	1	8 - 9	2035	0.0000	3	0.00	2035	0.0000	1	0.00	
10	1	9 - 10	2036	0.0000	3	0.00	2036	0.0000	1	0.00	
11	1	10 - 11	2037	0.0000	3	0.00	2037	0.0000	1	0.00	
12	1	11 - 12	2038	0.0000	3	0.00	2038	0.0000	1	0.00	
13	1	12 - 13	2039	0.0000	3	0.00	2039	0.0000	1	0.00	
14	1	13 - 14	2040	0.0000	3	0.00	2040	0.0000	1	0.00	
15	1	14 - 15	2041	0.0000	3	0.00	2041	0.0000	1	0.00	
16	1	15 - 16	2042	0.0000	3	0.00	2042	0.0000	1	0.00	
17	1	16-17	2043	0.0000	1	0.00	2043	0.0000	1	0.00	
18	1	17-18	2044	0.0000	1	0.00	2044	0.0000	1	0.00	
19	1	18-19	2045	0.0000	1	0.00	2045	0.0000	1	0.00	
20	1	19-20	2046	0.0000	1	0.00	2046	0.0000	1	0.00	
21	1	20-21	2047	0.0000	1	0.00	2047	0.0000	1	0.00	
22	1	21-22	2048	0.0000	1	0.00	2048	0.0000	1	0.00	
23	1	22-23	2049	0.0000	1	0.00	2049	0.0000	1	0.00	
24	1	23-24	2050	0.0000	1	0.00	2050	0.0000	1	0.00	
25	1	24-25	2051	0.0000	1	0.00	2051	0.0000	1	0.00	
26	1	25-26	2052	0.0000	1	0.00	2052	0.0000	1	0.00	
27	1	26-27	2053	0.0000	1	0.00	2053	0.0000	1	0.00	
28	1	27-28	2054	0.0000	1	0.00	2054	0.0000	1	0.00	
29	1	28-29	2055	0.0000	1	0.00	2055	0.0000	1	0.00	
30	1	29-30	2056	0.0000	1	0.00	2056	0.0000	1	0.00	
Total Increased Cancer Risk						**34.78**				**0.583**	

* Third trimester of pregnancy

Chalk hill Road Bridge Replacemnt - Construction Impacts
Maximum DPM Cancer Risk
Impacts at Off-Site Residential Receptors - 1.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Exposure Information				Infant/Child	Adult			Adult	
			DPM Conc (ug/m3)		Age	Cancer	Modeled DPM Conc (ug/m3)		Age	Cancer	
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**HI**
0	0.25	-0.25 - 0*	2027	0.0183	10	0.25					**HI**
1	1	0 - 1	2027	0.0183	10	3.01	2027	0.0183	1	0.053	0.004
2	1	1 - 2	2028	0.0168	10	2.75	2028	0.0168	1	0.048	0.003
3	1	2 - 3	2029	0.0000	3	0.00	2029	0.0000	1	0.000	0.000
4	1	3 - 4	2030	0.0000	3	0.00	2030	0.0000	1	0.000	0.000
5	1	4 - 5	2031	0.0000	3	0.00	2031	0.0000	1	0.000	0.000
6	1	5 - 6	2032	0.0000	3	0.00	2032	0.0000	1	0.00	
7	1	6 - 7	2033	0.0000	3	0.00	2033	0.0000	1	0.00	
8	1	7 - 8	2034	0.0000	3	0.00	2034	0.0000	1	0.00	
9	1	8 - 9	2035	0.0000	3	0.00	2035	0.0000	1	0.00	
10	1	9 - 10	2036	0.0000	3	0.00	2036	0.0000	1	0.00	
11	1	10 - 11	2037	0.0000	3	0.00	2037	0.0000	1	0.00	
12	1	11 - 12	2038	0.0000	3	0.00	2038	0.0000	1	0.00	
13	1	12 - 13	2039	0.0000	3	0.00	2039	0.0000	1	0.00	
14	1	13 - 14	2040	0.0000	3	0.00	2040	0.0000	1	0.00	
15	1	14 - 15	2041	0.0000	3	0.00	2041	0.0000	1	0.00	
16	1	15 - 16	2042	0.0000	3	0.00	2042	0.0000	1	0.00	
17	1	16-17	2043	0.0000	1	0.00	2043	0.0000	1	0.00	
18	1	17-18	2044	0.0000	1	0.00	2044	0.0000	1	0.00	
19	1	18-19	2045	0.0000	1	0.00	2045	0.0000	1	0.00	
20	1	19-20	2046	0.0000	1	0.00	2046	0.0000	1	0.00	
21	1	20-21	2047	0.0000	1	0.00	2047	0.0000	1	0.00	
22	1	21-22	2048	0.0000	1	0.00	2048	0.0000	1	0.00	
23	1	22-23	2049	0.0000	1	0.00	2049	0.0000	1	0.00	
24	1	23-24	2050	0.0000	1	0.00	2050	0.0000	1	0.00	
25	1	24-25	2051	0.0000	1	0.00	2051	0.0000	1	0.00	
26	1	25-26	2052	0.0000	1	0.00	2052	0.0000	1	0.00	
27	1	26-27	2053	0.0000	1	0.00	2053	0.0000	1	0.00	
28	1	27-28	2054	0.0000	1	0.00	2054	0.0000	1	0.00	
29	1	28-29	2055	0.0000	1	0.00	2055	0.0000	1	0.00	
30	1	29-30	2056	0.0000	1	0.00	2056	0.0000	1	0.00	
Total Increased Cancer Risk						**6.01**				**0.101**	

* Third trimester of pregnancy

APPENDIX C. NATURAL ENVIRONMENT STUDY

Chalk Hill Road Bridge Replacement Project at Maacama Creek



Natural Environment Study

Chalk Hill Road Bridge Replacement
Maacama Creek, Sonoma County, California
Chalk Hill Road (8806) PM 10.00 – 18.03 BRLO-5920(118)
Bridge Number: 20C 0242
County Project # C10002
Locator: 04-SON-0-CR
November 2022

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

DocuSign Envelope ID: 55E61C5A-D80C-4780-AC05-3362ABA43243

Chalk Hill Road Bridge Replacement Natural Environment Study

Bridge Number: 20C 0242
Project Number: BRLO-5920(118)
Locator: 04-SON-0-CR

November 2022

STATE OF CALIFORNIA
Department of Transportation
County of Sonoma

Prepared By: DocuSigned by: Eliza Schlein 585A6C3E512E46C... Date: 11/22/2022

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Summary

Purpose and Need

Caltrans has determined that the Chalk Hill Road Bridge (Caltrans Bridge No. 20C-0242) over Maacama Creek, in unincorporated Sonoma County, needs to be replaced because it is functionally obsolete. The purpose of replacing the bridge is to ensure that traffic can continue to traverse the creek safely.

Project Description

The existing Chalk Hill Road Bridge, bridge number 20C 0242, is a one-lane bridge in unincorporated Sonoma County constructed in 1915. The 2013 Caltrans Bridge Inspection Report (BIR) found the bridge to be functionally obsolete (FO) and the 2017 BIR assigned the bridge a Sufficiency Rating (SR) of 51.8 out of 100. Due to these inadequacies, the bridge will be replaced with a new two-lane bridge built to modern American Association of State Highway and Transportation Officials (AASHTO) standards, immediately to the west of the existing bridge. The replacement bridge will have two 11-foot lanes and two 4-foot shoulders for a total clear roadway width of 30 feet (see Appendix B. for 35% Project Plans). Construction of the new bridge and demolition of the old bridge will take place over two construction seasons.

During the first construction season, the new bridge and approach roadways will be constructed. A stream diversion system, if streamflow is present, will be implemented prior to any work to allow for safe fish passage during construction. Work within the stream channel will occur during the dry season, as to avoid impacts to fish and wildlife and water quality. The existing intersection at Chalk Hill Road and Young Road will be reconstructed to align with the new bridge approach and raised profile of Chalk Hill Road. Traffic on both roads will be maintained throughout construction to allow for access to residences located in and adjacent to the project area.

The existing bridge will be removed during the second construction season. The stream diversion system will also be implemented during the second construction season. The system may need to be covered to prevent debris from demolition from entering the water course. Following demolition of the existing bridge, scour countermeasures in the form of permanent log rootwads embedded in vegetated rock slope protection will be installed along the creek's south bank. Finally, all affected areas will be revegetated, and erosion control measures will be implemented.

Habitat Impacts

The proposed project would temporarily impact 0.01 acre of agricultural lands, 0.19 acre of developed/landscaped land, 0.01 acre of Himalayan blackberry brambles, 0.17 acre of coyote brush scrub, 2.06 acres of wild oat grassland, 0.04 acre of Arroyo Willow Thicket, less than 0.01 acre of California Bay Riparian Woodland, less than 0.01 acre of Mixed Oak Woodland, 0.11 acre (263 linear feet) of Perennial Stream (including Perennial Stream with other communities), 0.12 acre of Purple Needlegrass Grassland, 0.09 acre of Valley Oak Woodland, and 0.01 acre of Valley Oak-Oregon Ash Woodland. It would permanently impact less than 0.01 acre of agricultural lands, 0.31 acre of developed/landscaped land, 0.02 acre of Himalayan blackberry brambles, 0.04 acre of

Arroyo Willow Thicket, 0.06 acre (122 linear feet) of Perennial Stream (including Perennial Stream with other communities), 0.11 acre of Valley Oak Woodland, and 0.02 acre of Valley Oak-Oregon Ash Woodland.

Special-Status Species

The proposed **project may affect, not likely to adversely** affect California Coastal Chinook salmon, foothill yellow-legged frog, western pond turtle, and California giant salamander. No federally listed species within U.S. Fish and Wildlife Service (USFWS) jurisdiction are expected to be potentially present or affected by the proposed project. Section 7 Consultation with USFWS is not required. The proposed **project may affect, likely to adversely affect** Russian River tule perch, Central California Coast coho salmon, Central California Coast steelhead, and designated critical habitat for coho salmon and steelhead. Section 7 Consultation with the National Marine Fisheries Service (NMFS) will be required prior to construction. Pre-construction nesting bird surveys will be conducted if the proposed project begins during the nesting bird season (February 15 through August 15). In-water work will occur within Pacific Salmonid Essential Fish Habitat (EFH); however, a stream diversion system and other conservation measures will be instituted prior to any work within the creek to avoid and minimize impacts to EFH. The proposed project may **adversely affect** EFH. EFH Consultation with NMFS is required to assess impacts of the proposed project on EFH.

Invasive Species

The invasive plant species found in the BSA (based on Cal-IPC's inventory of invasive plants rated "high") are yellow starthistle (*Centaurea solstitialis*), medusa head (*Elymus caput-medusae*), fennel (*Foeniculum vulgare*), and Himalayan blackberry (*Rubus armeniacus*). The proposed project would remove individuals of these species in areas where the vegetation is disturbed by construction activities. A revegetation plan has not yet been developed for this project, but native plants will replace the invasive plants.

Resource Permits

Impacts to Maacama Creek would require a California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement (CFGC 1600 series) and possibly a Regional Water Quality Control Board (RWQCB) Clean Water Act (CWA) 401 certification and/or U.S. Army Corps of Engineers (USACE) CWA 404 nationwide permit as determined by a formal wetland delineation that was performed within the BSA. Since the Chalk Hill Road Bridge is listed as a Sonoma County landmark, its removal is subject to the approval of the Sonoma County Landmarks Commission during the CEQA process. No separate permit is required for this process.

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Chapter 1 – Introduction

Chalk Hill Road is a rural north-south minor collector road. It begins at Pleasant Avenue/Faught Road to the south and proceeds north 8.03 miles to its terminus at State Highway 128 in unincorporated Sonoma County, California (Figures i. and ii.). The existing one-lane bridge is a Sonoma County landmark that is eligible for inclusion on the National Register of Historic Places due to its age and unique character. However, the existing bridge is unsafe because it is at risk of collapse from earthquakes and/or resulting landslides, is scour critical, and has been deemed by Caltrans to be functionally obsolete.

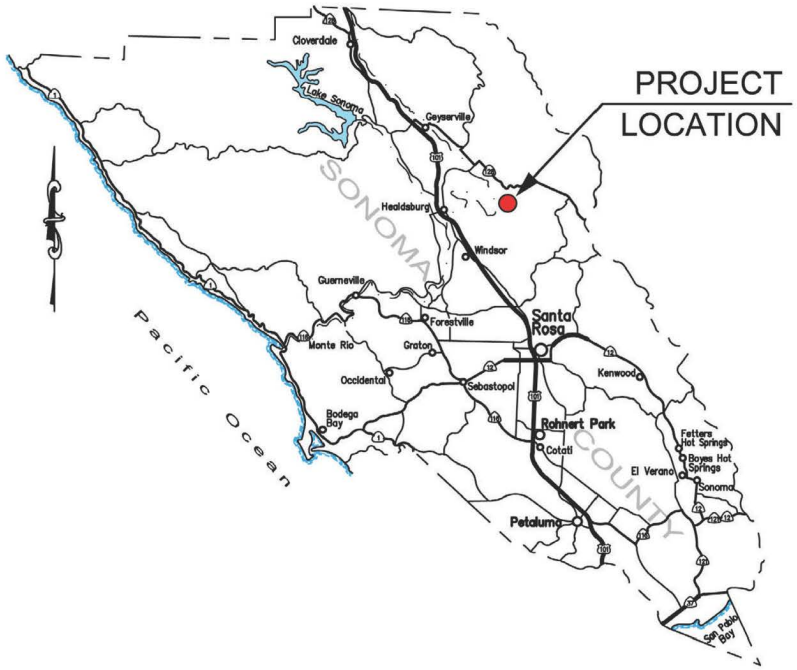


Figure i. – Project Vicinity Map (see Appendix A for larger version)

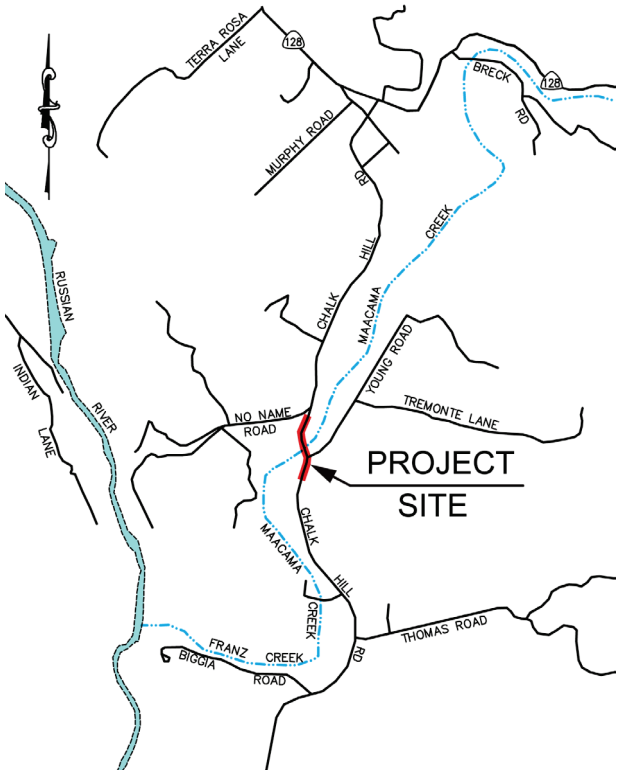


Figure ii. – Project Location Map (see Appendix A for larger version)

Project History

The existing bridge was constructed in 1915. The main span is an open spandrel concrete arch on reinforced concrete thrust blocks. The approach spans are reinforced concrete T-beams on wall piers with unknown foundations. Both approaches have moderately tight-radius curves. The existing guard rail is an open style aesthetic concrete baluster, and there are approach rails on all four corners. Portions of the existing guard rail were damaged and replaced in the past with rails of differing materials and appearance. Dimensions of existing bridge are depicted in Figure 3.

Based on the 2017 Caltrans BIR, the existing bridge has a MAP-21 Sufficiency Rating of 51.8 out of 100. The special (hydraulic) 2016 Caltrans BIR found that the bridge is scour critical. The 2013 Caltrans BIR found the bridge to be functionally obsolete) because it has only one lane, so vehicles approaching from opposite directions must be vigilant about taking turns in crossing it. The bridge is not currently load limited and there are 15-mph advisory postings as well as one-lane bridge signs at the north and south approaches to the bridge.

All deficiencies at the crossing will be resolved with a complete bridge replacement.

Project Description

The proposed project includes constructing a new replacement bridge and reconstructing the intersection with Young Road southeast of the replacement bridge. The existing

historic bridge will then be demolished, and scour countermeasures installed along the south creek bank.

New Replacement Bridge

The existing one-lane substandard bridge will be replaced with a two-lane bridge built to modern AAASHTO standards. The replacement bridge will have two 11-foot lanes and two 4-foot shoulders for a total clear roadway width of 30 feet.

A 30-foot clear width meets minimum AASHTO lane and shoulder widths for an average daily traffic (ADT) count of 400 – 1,500 and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed use.

The replacement bridge will be a new two-lane crossing downstream (west) of the existing bridge. The new bridge will cross the creek with a single-span concrete box girder and will be supported on reinforced concrete abutments. Retaining structures will be built along the west side of the bridge at the north approach roadway to minimize the take of farmland for new right-of-way, and at the south approach roadway to minimize the extent of embankment fill.

Reconstruct Intersection at Young Road

The existing intersection of Chalk Hill Road at Young Road is near the southwest bridge quadrant. Young Road provides access to several residences and must remain open during construction of the new bridge.

The existing intersection must be reconstructed so that it extends to the new south approach alignment and conforms to the raised profile Chalk Hill Road. Reconstruction must occur in stages to maintain traffic on Chalk Hill Road and to maintain access to homes on Young Road.

Existing Historic Bridge Removal

Several methods were considered to rehabilitate the existing historic bridge. Unfortunately, the extent of deficiencies in the existing bridge requires a degree of seismic retrofitting that would render it unrecognizable and adversely impact its historic features.

Although some retrofit methods are feasible, it is not prudent to rehabilitate the existing bridge because it would remain functionally obsolete while destroying its historic features.

Scour Countermeasures

Scour countermeasures are necessary to stabilize the south creek bank and to protect the new replacement bridge. In addition to locating the new bridge foundations below the estimated scour depth, scour countermeasures include the installation of vegetated Class IV rock slope protection (RSP) and large logs with root wads to provide additional scour protection and complex stream habitat elements.

TRAFFIC

Recent traffic counts indicate that the bridge carries a daily traffic volume of approximately 800 ADT. Using a 1% growth factor for this remote area, traffic in 2041 is predicted to be 1,100 ADT.

The existing bridge will remain open during construction to maintain traffic. Once completed, traffic will be switched onto the new bridge.

UTILITIES

There are no known underground utilities near the existing bridge. Overhead power and phone lines are present and must be relocated or deactivated during construction of the new bridge.

RIGHT-OF-WAY

Chalk Hill Road at the bridge site is approximately 22 feet wide and its right-of-way at the bridge site is presumed to be 40 feet by prescriptive rights. The proposed project requires additional Right-of-Way (ROW) for the bridge and approach roadways. ROW engineering will be undertaken to determine the location of adjacent property lines and to establish the required additional ROW.

The bulk of the ROW take is located at Assessor's Parcel Number (APN) 132-080-023 with the remaining take located on APNs 132-060-013 and 132-080-003.

Topographic surveys were performed to locate existing facilities and to identify trees that are 4 inches and larger as measured at mid-breast height. The selected alignment avoids or minimizes the additional ROW that must be acquired and minimizes the number of trees that must be cut.

ROW engineering and boundary surveys will be conducted to verify the existing ROW and to identify the additional ROW required.

TEMPORARY CONSTRUCTION EASEMENTS

The proposed project requires temporary construction easements (TCE) from APNs 132-060-013, 132-080-022 and 132-080-017. TCEs are needed at these locations to access the creek bed and to provide staging areas for construction of the new bridge and removal of the existing bridge.

CONSTRUCTION

Two construction seasons are anticipated for this project. The replacement bridge will be built and put into service during the first construction season. Demolition of the existing bridge and implementation of scour countermeasures will occur during the following construction season.

Work below top of bank will be limited to the dry season, June 15 to October 15, or as specified by applicable permits. The creek channel is expected to have minimal or no flow throughout the construction season, depending on the water year, requiring only a minor diversion of the creek flow.

Unless otherwise specified in applicable permits or the contract specifications, construction hours are limited to:

MONDAY – FRIDAY	7:00 a.m. to 7:00 p.m.
WEEKENDS AND HOLIDAYS	9:00 a.m. to 7:00 p.m.

Construct the New Bridge:

Construction work within the wetted the channel is limited to that necessary to construct falsework or the abutments.

Access to the creek bed requires grading of the north and south creek banks. The north access point is west the existing north abutment. The south access point is west of the

proposed scour countermeasures. A third access point, if needed, is adjacent to the south abutment of the replacement bridge and will be located to minimize vegetation removal.

If streamflow or pools are present, dewatering of the work area and a stream diversion system will be necessary to build the new bridge, remove the existing bridge, and install the scour countermeasures. The temporary, gravity-flow diversion channel will be located mid-channel. Minimal creek bed grading and vegetation removal may be required. Temporary K-rail will be used to create a 4-foot-wide channel, gravity-flow diversion channel anticipated to be approximately 130 feet in length in Year 1 and 170 feet in length in Year 2 to accommodate streamflow, if flow is present. The stream diversion system diagrams for Year 1 and Year 2 are shown in Appendix C. The K-rail will also allow for a protective covering to be placed over the channel to prevent any falling debris from entering the flowing stream. If pools are present, the temporary channel will extend from a seasonal pool evident during initial surveys 50 feet upstream of the existing bridge to another seasonal pool evident at the time 200 feet downstream, and in this case would be up to approximately 285 feet in length. However, the channel bed, including the location of any pools present, may vary from year to year. The protective channel covering below the superstructure work area to protect the channel from falling construction debris, if needed, would consist of 2-inch x 4-inch framing and plywood supported directly on the K-rails. The diversion will be installed in each of the two construction seasons if flowing water is present prior to construction. The diversion system will be removed in its entirety following each construction season.

Clean 1 ½" drain rock up to 2-feet deep is placed to protect the creek bed and to create work pads that support falsework and construction equipment. The drain rock may remain after the dry season ends and need not be removed.

Equipment to construct the new bridge includes generators, air compressors, drill rigs, cranes, excavators, loaders, gravel trucks, concrete trucks, concrete pumps, and other track mounted or wheel mounted equipment.

Work on the new bridge approach roadways may occur at any time during the year so long as stream protections are implemented.

Best Management Practices (BMPs) for stream protection will be implemented at creek bed access points and at the new roadway approaches to winterize the construction site. BMPs include placing jute mesh on exposed ground surfaces, hand cast seeding and the placement of silt fences and straw wattles to prevent sediment from entering the creek or drainage inlets.

The general construction sequence is as follows:

1. Implement stream protection BMPs,
2. Abutment work and retaining wall work outside the channel may begin,
3. Construct access to the creek bed after the dry season begins,
4. Construct a stream diversion channel that allows fish to pass, implement fish capture and relocation plan if streamflow or pools are present,
5. Place up to 2 feet of clean 1 ½" drain rock over the creek bed,
6. Complete the bridge abutments,
7. Erect falsework in the creekbank over the drain rock pad,
8. Construct the box girder superstructure,

9. Remove the stream diversion system, falsework and any construction debris before the dry season ends,
10. Place large boulders at toe of south creekbank as a temporary scour countermeasure,
11. Winterize the creek bed access points,
12. Complete the retaining walls and wingwalls,
13. Complete the approach roadways and the new intersection at Young Road,
14. Complete the bridge barriers and approach guardrails,
15. Complete roadway and intersection signage and striping, and
16. Protect the approach embankments with jute mesh and hand-cast seeding.

Traffic may now be switched onto the new bridge.

Removal of the Existing Bridge and Installation of Permanent Scour Countermeasures:

Construction work within the wetted channel is limited to demolition of the existing bridge and installation of permanent scour countermeasures (see Figure iii.). The work must occur during the dry season that follows construction of the replacement bridge.

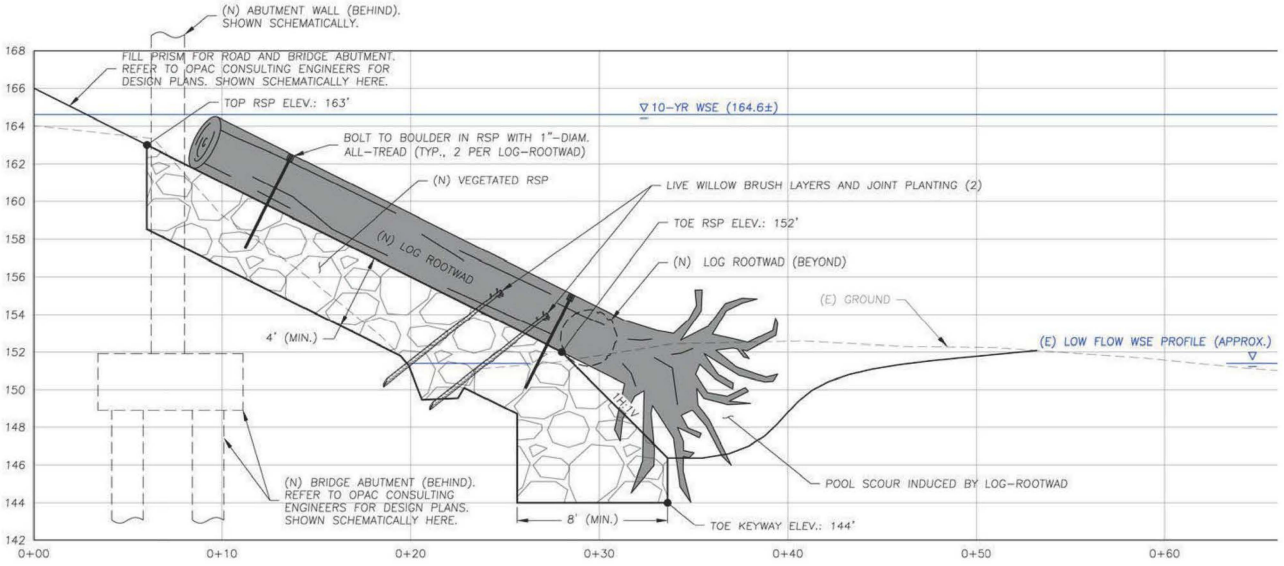


Figure iii. – South Creek Bank Scour Countermeasures (see Appendix B. for 35% Project Plans)

The removal and installation sequence are as follows:

1. Restore creek protection BMPs,
2. Reconstruct access to the creek bed after the dry season begins,
3. Reconstruct a stream diversion channel that allows fish to pass, implement fish capture and relocation plan if streamflow or pools are present,
4. Place up to 2 feet of clean 1 ½" drain rock over the creek bed,
5. Demolish the existing bridge and remove from the site to a legal disposal facility,
6. Trim back the large tuff block that supported the existing bridge,
7. Secure the remainder of the tuff block with soil nails,
8. Install permanent scour countermeasures along south creek bank,
9. Remove the stream diversion system and any remaining construction debris,
10. Regrade the creek bed to restore its original contours before the dry season ends,
11. Regrade channel access to match the surrounding topography and re-vegetate,
12. Implement BMPs to winterize the former creek access points,
13. Remove pavement from the old bridge approaches and rip the soil to a 2-foot depth, and
14. Re-vegetate the old bridge approaches and implement erosion control.

The Contractor may now fully demobilize and move out from the project site.

Chapter 2 – Study Methods

The County's environmental consultants, WRA, Inc. (WRA), have conducted biological resource assessments of the Biological Study Area (BSA). In 2019, WRA plant ecologist Rhiannon Korhummel mapped the extent of the riparian area and all vegetative communities within the 16.09-acre BSA. In September 2021, WRA wildlife biologists Erik Schmidt and Eliza Schlein examined the BSA on foot to validate the vegetation communities observed during the 2019 site visit and to determine if existing conditions provide suitable habitat for any special-status plant or wildlife species that have a potential to occur within the vicinity of the BSA. Special-status plant surveys were conducted by WRA botanist Rhiannon Korhummel on April 15, May 16, and June 5, 2022. Rhiannon Korhummel also conducted a formal wetland delineation for the project in November 2022. The regulatory framework under which the assessment was conducted, and the methods used to conduct the assessment are described in the following section.

Regulatory Requirements

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 provides a framework which federal agencies must follow in evaluating environmental impacts of their actions. Actions by federal agencies must "use all practicable means and measures" to avoid or lessen impacts to the environment. In 2007, formal guidance for the continuation of a pilot program was issued which allows Caltrans to assume all of the Federal Highway Administration (FHWA) environmental responsibilities under NEPA and other environmental laws (NEPA Delegation). This delegation authority is limited to highway projects, including Local Assistance Federal Aid projects, and specific projects within the State or a programmatic delegation. Therefore, Caltrans must ensure joint projects with FHWA or projects funded with Federal Aid are in compliance with NEPA.

WETLAND AND WATERS

Section 10 of Rivers and Harbors Act of 1899

The Rivers and Harbors Act requires permits in navigable waters of the U.S. for all structures such as riprap and activities such as dredging. The term navigable waters of the United States and all other terms relating to the geographic scope of jurisdiction are defined at 33 CFR part 329. Generally, they are those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. The United States Army Corps of Engineers (USACE) grants or denies permits based on the effects on navigation. Maacama Creek is a tributary to the Russian River, which is only considered navigable below Vacation Beach which is farther than 10 miles downstream of the site (http://www.spn.usace.army.mil). Therefore, this creek is not considered a navigable water subject to the Rivers and Harbors Act.

Clean Water Act (CWA)

The CWA provides guidance and regulation for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 identifies

the USACE jurisdiction over fill materials in essentially all water bodies, including wetlands. All federal agencies are required to avoid impacts to wetlands whenever there is a practicable alternative. Section 404 established a permit program administered by USACE regulating the discharge of dredged or fill material into Waters of the U.S. (including wetlands).

Section 401 of the CWA requires that an applicant for a federal license or permit that allows activities resulting in a discharge to Waters of the U.S., obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Boards (RWQCB) administer the certification program in California. The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Executive Order 11990 – Protection of Wetlands

This order established a national policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. The U.S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this directive. On federally funded projects, impacts to wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding. An additional requirement is to provide early public involvement in projects affecting wetlands. FHWA provides technical assistance (Technical Advisory 6640.8A) and reviews environmental documents for compliance.

California Porter-Cologne Water Quality Control Act

This state water quality law affects projects involving impacts to isolated Waters of the State (non-404/401 waters). The RWQCB requires Waste Discharge Requirement (WDR) permits for impacts to Waters of the State.

Streams, Lakes, and Riparian Habitat in California

Streams and lakes, as habitat for fish and wildlife species, are subject to the jurisdiction of California Department of Fish and Wildlife (CDFW) under Sections 1600-1616 of the California Fish and Game Code. Alterations to, or work within or adjacent to streambeds or lakes generally require a 1600 series Lake and Streambed Alteration Agreement. The term “stream,” which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Lake and Streambed Alteration Agreement from CDFW.

INVASIVE SPECIES

Executive Order 13112 – Invasive Species

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council (Cal-IPC 2021) to define the invasive plants that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project. Under the EO, federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

PROTECTED SPECIES

Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act or California Endangered Species Act. These acts afford protection to both listed and proposed species. In addition, California Department of Fish and Wildlife Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under the California Environmental Quality Act (CEQA). In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, or young is illegal. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory with California Rare Plant Rank of 1 or 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA.

Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), was enacted to provide a means to identify and protect endangered and threatened species. Under Section 9 of the ESA, it is unlawful to take any listed species. “Take” is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting a listed species. “Harass” is defined as an intentional or negligent act or omission, which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering. “Harm” is defined as an act which actually kills or injures fish or wildlife and may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral

patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Actions that may result in “take” of a federal-listed species are subject to USFWS or National Marine Fisheries Service (NMFS) permit issuance and monitoring. Section 7 of ESA requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat for such species. Any action authorized, funded, or carried out by a federal agency or designated proxy (e.g., Caltrans) which has potential to affect listed species requires consultation with NMFS under Section 7 of the ESA.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

California Endangered Species Act

CDFW is responsible for administering California Endangered Species Act (CESA, CDFG Code §§2050, et seq.), which prohibits take of species that have been listed, or are considered for listing (candidate species) as threatened or endangered species within the State of California. CESA allows for incidental take of state listed species through issuance of an Incidental Take Permit, or through a Consistency Determination in coordination with a Biological Opinion issued by the USFWS (CDFW Code Section 2081). In contrast with federal law, the definition of “take” under CESA involves actual harm to one or more members of a listed species and does not extend to modification of habitat not involving direct take.

Migratory Bird Treaty Act and California Fish and Game Code

This treaty with Canada, Mexico and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. California Fish and Game Code (Sec 3500) also prohibits the destruction of any nest, egg, or nestling.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2021). Sensitive plant communities are also identified by CDFW. CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2010) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations

or those identified by the CDFW or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

LOCAL POLICIES AND ORDINANCES

Sonoma County Municipal Code

In 1986, Sonoma County approved the Tree Protection Ordinance which requires that applicants for discretionary development permits identify trees proposed for removal and trees proposed for protection for each proposed project. If trees are planned to be protected, tree protection measures are required during construction. If trees that were not planned for removal are damaged, replacements or payment of an in-lieu fee is required. The ordinance provides protections to eleven specific species of trees, including madrone, big leaf maple, bay, redwood and seven varieties of oak.

The Valley Oak Habitat Combining Zone is a land use designation applied to parcels with soils that typically support valley oaks. The purpose of this zone is to protect and enhance one particular tree species and plant community type, the valley oak (Quercus lobata) and valley oak woodland. In this zone, a permit is required to cut down any valley oak tree with a diameter at breast height (dbh) greater than 20 inches, or multiple trees having a cumulative dbh greater than 60 inches. The applicant must mitigate the resulting loss of trees by methods specified in the ordinance, such as by retaining other valley oaks on the property, planting replacement valley oaks on- or off-site, or paying an in-lieu fee per tree to support a county parks planting program (County of Sonoma 2021).

Studies Required

WRA conducted field studies in the entire BSA to evaluate the presence or potential presence of special-status species and sensitive habitats. Methods used during the site visits to make determinations for this NES are described below.

Special-Status Species

Prior to the field site visits to the BSA, the following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the BSA:

- California Natural Diversity Database (CNDDB) records for the Healdsburg, Jimtown, Mount St. Helena, Mark West Springs, Santa Rosa, Sebastopol, Camp Meeker, Guerneville, Geyserville U.S. Geological Service 7.5' Quadrangles (CDFW 2021)

- USFWS official species list for the proposed Project (USFWS 2021; Appendix D)

- CNPS Inventory of Rare, Threatened, and Endangered Plants of California records for the Healdsburg, Jimtown, Mount St. Helena, Mark West Springs, Santa Rosa, Sebastopol, Camp Meeker, Guerneville, Geyserville U.S. Geological Service 7.5' Quadrangles (CNPS 2021)

- CDFG publication "California's Wildlife, Volumes I-III" (Zeiner et al. 1990)

- CDFW and University of California Press publication California Amphibian and Reptile Species of Special Concern (Thomson et al. 2016)

- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)

- University of California at Davis, Center for Watershed Sciences. Pisces: California Fish Data and Management Software (2021)

- NMFS Essential Fish Habitat Maps of California (2021)

- NMFS official species list for the Healdsburg Quadrangle and the West Coast(NMFS 2016; Appendix E)

Special-Status Species. During the June 2019 site visit, WRA plant biologist Rhiannon Korhummel surveyed all plant species within the BSA. Targeted floristic surveys for special-status plant species were performed on April 15, May 16, and June 5, 2022 during specified flowering periods. For special-status wildlife species, WRA biologists completed a survey to determine the potential for the BSA to support special-status species, but the studies did not constitute protocol level surveys. Habitat conditions observed in the BSA during the site visits were used to evaluate the potential for presence of special-status species based on these literature searches and the professional expertise of the investigating biologists. Table 1 presents the evaluation of habitat potential for each special-status plant and wildlife species documented to occur in the vicinity of the BSA based on the literature database search. A list of all plant and wildlife species observed during the site visit is provided in Appendix F. The USFWS official list of species listed under the federal ESA and under jurisdiction of the USFWS with a potential to occur in the proposed project vicinity is provided in Appendix D.

Vegetation Communities and Sensitive Habitats. Vegetation communities present in the BSA were classified based on existing plant community descriptions described in *A Manual of California Vegetation, 2nd Edition* (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). However, in some cases it was necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature.

Biological communities were classified as sensitive or non-sensitive as defined by CEQA. Sensitive plant communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by CDFW. CDFW ranks sensitive communities as 'threatened' or 'very threatened' and keeps records of their occurrences in its CNDDB. Also, vegetation alliances are ranked 1 through 5 (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). Alliances ranked globally (G) or statewide (S) as 1 through 3 are considered sensitive. Rank "Y" is for associations considered sensitive. It is equivalent to an S3 ranking. Impacts to sensitive natural communities identified in local or regional plans, policies, regulations, or by CDFW or USFWS must be considered and evaluated under CEQA.

Section 404 "Waters of the U.S." WRA conducted a wetland delineation to evaluate the presence of jurisdictional waters in the BSA in November 2022. The BSA was evaluated for the presence of indicators of wetlands and "other waters." The Corps regulates "Waters of the United States" under Section 404 of the Clean Water Act (CWA). Waters of the United States are defined in the Code of Federal Regulations (CFR) as including the territorial seas, and waters which are currently used, or were used in the past, or may be

susceptible to use in interstate or foreign commerce, such as tributaries, lakes and ponds, impoundments of waters of the U.S., and wetlands that are hydrologically connected with these navigable features (33 CFR 328.3).

The methods used to delineate potential jurisdictional wetlands and waters were based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* ("Arid West Supplement"; USACE 2008). The routine method for wetland delineation described in the Corps Manual was used to identify areas potentially subject to Corps Section 404 jurisdiction within the BSA.

The BSA was evaluated for the presence or absence of indicators of the three wetland parameters described in the Corps Manual and Arid West Supplement. The three parameters are the presence of: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the Corps Manual, for areas not considered "problem areas" or "atypical situations":

> *"... [E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination."*

WRA also evaluated the presence of unvegetated "other waters" potentially subject to Corps jurisdiction under Section 404 of the Clean Water Act. Besides wetlands, other areas subject to Corps jurisdiction include lakes, rivers and streams in addition to all areas below the high tide line (HTL) in areas subject to tidal influence. Jurisdiction in non-tidal areas extends to the ordinary high water mark (OHWM) defined as:

> "*...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*" Federal Register Vol. 51, No. 219, Part 328.3 (e). November 13, 1986.

Identification of the OHWM at this site followed the Corps Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (Corps 2005), which provides a list of indicators, such as shelving, natural lines impressed on the bank, wrack lines, scour, and sediment deposition. These indicators were used to map the location of the OHWM for "other waters" in the BSA. The Delineation of Potential Waters of the U.S. for the proposed project is included in Appendix G.

Personnel and Survey Dates

Erik Schmidt and Eliza Schlein, WRA fisheries and wildlife biologists, conducted a biological resource site assessment on September 14, 2021. WRA plant biologist Rhiannon Korhummel conducted a preliminary assessment of the vegetative communities and potential wetland features on June 6, 2019, and conducted targeted floristic surveys for special-status plant species on April 15, May 16, and June 5, 2022 during specified flowering periods. Rhiannon Korhummel also conducted a site visit on October 27, 2022, to access if any changes to the delineation may be appropriate. Their qualifications are provided in Appendix H.

Agency Coordination and Professional Contacts

On October 16, 2019, NMFS biologist Jodi Charrier met with staff from Caltrans, Sonoma County, and project consultants to visit the BSA and discuss the proposed project.

Limitations That May Influence Results

The site visits were conducted during daylight hours and consisted of an assessment of likely habitats for special-status plants and wildlife; the assessments did not conform to specific USFWS or NMFS protocols for any species. No detailed fish studies were completed to identify and enumerate fish species present or potentially present. The second site visit did not take place during typical water year conditions; the area was experiencing an extreme drought and the only water present onsite was a shallow, stagnant and receding pool at the base of the south bridge abutment. Due to variable water levels in the region, water levels at the time of the site visit do not necessarily represent those that will exist during construction. Data and documents from previous studies in the area were relied upon to evaluate potential presence of fish species.

Chapter 3 – Results: Environmental Setting

This section describes the region in which the proposed project will occur. It is intended to explain context and the level of intensity of impacts. It includes a brief description of the area's topography, soils, habitat, watercourses, and level of human or natural disturbance.

Description of the Existing Biological and Physical Conditions

BIOLOGICAL STUDY AREA

The BSA is located on and around the Chalk Hill Bridge over Maacama Creek in unincorporated Sonoma County, California. The BSA covers all areas where direct and indirect impacts would occur such as ground-disturbance, construction staging, access roads, and noise disturbances. The BSA is extended beyond areas of the proposed project footprint or direct impacts to ensure that key biological issues are addressed. Chalk Hill Road is a rural north-south minor collector road. It intersects with Young Road, another rural collector road within the BSA. The adjacent land use is residential (single family homes) and agricultural. The BSA extends approximately 0.2 mile south of Chalk Hill Bridge and into the wild oat grassland along the west side of Chalk Hill Road that will be used as a staging area.

Site elevations range from approximately 148 feet to 244 feet (NAVD88). The bridge is located on the Healdsburg USGS 7.5-minute quadrangle map at latitude 38.621944, longitude -122.773611.

PHYSICAL CONDITIONS

Topography

Maacama Creek flows under Chalk Hill Bridge through the BSA. The creek bed is composed of mainly of gravel and cobble substrate with some larger boulders. The banks of the creek were difficult to determine during the September 14, 2021, site visit due to the historic drought, but evidence of very high flows was shown through deposits of debris high in the bridge abutments. Severe erosion along the southern bank has caused the top of bank to degrade to a sheer rock face approximately 30 feet high along the extent of Chalk Hill Bridge. The northern bank of Maacama creek has a more gradual slope. The BSA outside of the creek is mostly developed or managed low-density residential housing or agricultural lands on relatively flat ground.

Hydrology

Maacama Creek is a blueline stream that is typically perennial at this location. There was little to no water in the creek during the September 14, 2021 site visit due to the timing of the visit during an historic drought. Only a small, stagnant and receding pool approximately 6 feet wide, 30 feet long, and a maximum of 8 inches deep remained. However, on a previous site visit by a WRA biologist on June 6, 2019, there was continuous stream flow through the BSA. The principal natural hydrological sources for the BSA are creek flow from the upstream watershed, direct precipitation, and surface runoff from adjacent lands. The Maacama Creek watershed drains approximately 69.7 square miles and is a tributary of the Russian River. The confluence of Maacama Creek

and the Russian River is approximately 1.45 miles downstream of the BSA, with a tributary, Franz Creek, flowing into Maacama Creek between the confluence and the BSA.

Soils

The soils that occur in the BSA are Langier loam, with varying slopes, in the southern portion of the BSA in the grassland that will serve as the staging area along the western edge of Chalk Hill Road, Riverwash within the creek bed of Maacama creek, and Haire clay loam (0 to 9 percent slopes) to the north of Chalk Hill Road bridge (SoilWeb 2021). The Langier series is a medial, mixed, thermic typic Haploxerand. The drainage class is well to somewhat excessively drained. The Haire series is a fine, mixed, superactive, thermic typic Haploxerult. The drainage class is moderately well drained. Soil taxonomy information is not available on the Riverwash soil designation.

BIOLOGICAL CONDITIONS IN THE BIOLOGICAL STUDY AREA

Sensitive Habitats

Perennial Stream

Maacama Creek is a typically perennial creek, though flows vary with the rainfall patterns of a given season and year (Appendix A, Figure 2). Only a small pool measuring 30 feet long by 6 feet wide was observed during the September 14, 2021 site visit. The pool measured approximately 8 inches in depth. The creek is a tributary of the Russian River and is supported by an approximately 70 square mile watershed (Sonoma RCD 2021). The creek substrate is composed of a mixture of gravel and cobble, with some larger stones throughout. Indicators of OHWM include a shift in vegetation and scour along the bank. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior. The formal wetland delineation determined that there is 1.09 acres of stream within the BSA (Appendix G, Figure 4).

Seasonal Wetland

A portion of a seasonal wetland is present in the very southern portion of the BSA (Appendix G, Figure 4). The feature is located at the base of a small slope and extends south, outside of the southern boundary of the BSA. Vegetation is dominated by Italian rye grass (*Festuca perennis,* FAC). Redoximorphic concentrations were observed in dark soils; soils meet Redox Dark Surface (F6) hydric soil indicator. No indicators of hydrology were observed and are considered naturally problematic. However, the feature is located in a topographic position which likely collects water and exhibits hydrophytic vegetation and hydric soils; as such, hydrology is presumed present but not observed due to timing of the delineation. The boundary of the feature was delineated using shift in vegetation and topography.

Mixed Oak Woodland (*Quercus* Forest & Woodland Alliance; Rank G4S4)

The mixed oak woodland community occurs immediately to the west of the wild oat grassland community on the most southwestern edge of the BSA (Appendix A, Figure 2). The canopy is composed of a mixture of valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia)*, and blue oak (*Quercus douglasiil)* with scattered California bay (*Umbellularia californica*). The understory is comprised of mainly non-native shrubs such

as vinca (*vinca major)* and Himalayan blackberry (*Rubus armeniacus*). This community is considered sensitive in Sonoma County under the California Oak Woodlands Conservation Act.

California Bay Riparian (*Umbellularia californica* Forest & Woodland Alliance; Rank S3G4)

The California bay riparian woodland community occurs along the southeastern edge of Maacama Creek within the BSA (Appendix A, Figure 2). In this area of the BSA, the creek bank is a steep rock face. The trees do not grow directly adjacent to the creek, but would be considered riparian as their drip line extends over top of bank. The overstory of this community is composed of California bay trees (*Umbellularia californica*) with an understory of common snowberry (*Symphoricarpos albus var. laevigatus*) and California wild grape (*Vitis californica*). This biological community is listed as sensitive on the California Natural Community List (CDFW 2021).

Valley Oak Woodland (*Quercus lobata* Woodland Alliance; Rank S3G3)

The valley oak woodland community occurs along the western border of Chalk Hill Road, beginning at the southern edge of the existing bridge and extending southward until the landscaped area of the closest residence, excluding the area of coyote brush (Appendix A, Figure 2). The dominant canopy cover in this community is valley oak (*Quercus lobata*) with some scattered willows of various species (*Salix* sp.). The understory is dominated by poison oak (*Toxicodendron diversilobum*). This biological community is listed as sensitive on the California Natural Community List (CDFW 2021).

Valley Oak-Oregon Ash Woodland (*Quercus lobata* Riparian Alliance; Rank S3G3)

The Valley Oak-Oregon Ash Woodland community occurs along the northwestern edge of Maacama Creek within the BSA (Appendix A, Figure 2). Valley oak and Oregon ash (*Fraxinus latifolia*) are equally dominant in the canopy of this community. Himalayan blackberry and California wild grape are the dominant understory cover. This biological community is listed as sensitive on the California Natural Community List (CDFW 2021).

Purple Needlegrass Grassland (*Stipa pulchra* Grassland Association; Rank Y)

The Purple Needlegrass community occurs in several patches in the upland field southwest of the bridge within the BSA (Appendix A, Figure 2). Purple needlegrass (*Stipa pulchra*) is dominant in the herbaceous layer and California oatgrass (*Danthonia californica*) is characteristically present. Associated species include soft chess (*Bromus* hordeaceus), Italian ryegrass (*Festuca perennis*) and elegant brodiaea (*Brodiaea elegans*). This biological community is listed as sensitive on the California Natural Community List (CDFW 2021).

Non-Sensitive Habitats

Ruderal/Disturbed

The Ruderal/Disturbed/Developed portions of the BSA include the paved areas of Chalk Hill Road and Young Road that run through the BSA, including the existing bridge footprint (Appendix A, Figure 2). This community also includes all areas with residential structures (homes and outbuildings), associated landscaping, and gravel and dirt roadsides.

Vegetation in this community predominately consists of non-native species commonly found in the region, such as Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus)*, fennel (*Foeniculum vulgare)*, and non-native grasses.

Wild Oats Grassland (*Avena* spp. Herbaceous Semi-Natural Alliance; No Rank)

The wild oat grassland community occurs in the portion of the BSA that is proposed to be utilized as the staging area for the bridge construction and road approach work (Appendix A, Figure 2). This area is composed of a vacant lot on the western side of Chalk Hill Road in the southwestern portion of the BSA. Vegetation in this community is dominated by non-native annual grasses such as wild oat (*Avena barbata*) and Italian rye grass (*Festuca perennis*) with interspersed native grasses such as purple needle grass (*Stipa pulchra*) and amole (*Chlorogalum pomeridianum*) at much lower densities. A few scattered oak trees are found throughout this community.

Himalayan Blackberry (*Rubus armeniacus* Shrubland Semi-Natural Alliance; No Rank)

The Himalayan blackberry community occurs along the northern bank of Maacama Creek in the BSA, mainly underneath the existing Chalk Hill Road Bridge (Appendix A, Figure 2). The upland area is overgrown with mainly Himalayan blackberry (*Rubus armeniacus*) and other scattered shrubs such as vinca (*Vinca major*) and California wild grape (*Vitis californica*).

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance; Rank S5G5)

The coyote brush scrub community occurs between arroyo willow and valley oak upland woodland communities (Appendix A, Figure 2). The area is dominated by mainly coyote brush (*Baccharis pilularis*) with scattered poison hemlock (*Conium maculatum*). The understory is composed of a variety of non-native annual grasses similar to those found in the wild oat grassland community described above.

Coast Live Oak Woodland (*Quercus agrifolia* Forest & Woodland Alliance; Rank S4G5)

The coast live oak woodland community occurs along the eastern edge of Chalk Hill Road just south of the residence at the intersection of Young Road and Chalk Hill Road (Appendix A, Figure 2). The canopy is dominated by coast live oak with some other oaks, such as valley oak, scattered throughout. There was evidence of fire activity in this community in the recent past during the September 14, 2021, site visit. An understory had not fully developed.

Knobcone Pine Forest (*Pinus attenuata* Forest & Woodland Alliance; Rank S4G5)

The knobcone pine forest community occurs along the eastern border of the BSA, south of the residence that is adjacent to the intersection of Young Road and Chalk Hill Road (Appendix A, Figure 2). Due to the proximity of this community to private property, the area was not directly surveyed during the site visits. From a distance it is apparent that the canopy is dominated by knobcone pine (*Pinus attenuate*) with sparse understory.

Arroyo Willow Thicket (*Salix lasiolepis* Shrubland Alliance; Rank S4G4)

The arroyo willow thicket community occurs within the creekbed of Maacama Creek and along the northern banks where the slope is more gradual toward the top of bank

(Appendix A, Figure 2). The soil substrate transitions from gravel to finer grained soil, allowing for the establishment of vegetation along the riparian corridor. The community is dominated by arroyo willow shrubs (*Salix lasiolepis*) with a dense understory of mostly Himalayan blackberry (*Rubus armeniacus*). This biological community as a vegetation alliance is not listed as sensitive on the California Natural Community List, due to the understory of non-native vegetation (CDFW 2021).

Wildlife Species in the BSA

Wildlife species observed within the BSA are detailed in Appendix F. There are no total barriers to fish passage downstream of the BSA. Maacama Creek has documented presence of Central California Coast coho salmon (*Oncorhynchus kisutch,* Federal endangered; State endangered) and Central California Coast steelhead (*Oncorhynchus mykiss,* Federal threatened), and is within designated critical habitat for both species (70 FR 52488). California Coastal Chinook salmon have not been widely documented in the Maacama Creek watershed (CDFW 2021, NMFS 2005), however observations of Chinook salmon in Redwood Creek, which joins Maacama Creek upstream of the BSA, were made in the winter of 2015-2016 and 2016-2017 (UC Sea Grant 2021, Sonoma Resource Conservation District 2015) and this species is therefore assumed present. Although there was only a very small, stagnant and receding pool of water remaining within the channel during the September 14, 2021 site visit, and habitat for salmonids was not present, in a more typical water year, the BSA could potentially support native anadromous fish species in flowing or pooled portions of the channel.

INVASIVE SPECIES

Federal Highway Administration guidance issued August 10, 1999, states that the State's invasive species list, maintained by the California Invasive Species Council be used to define the invasive plants. The California Invasive Plant Council (Cal-IPC) Inventory and CDFA maintain lists of invasive plant species. Cal-IPC list categorizes plants as High, Moderate, or Limited, reflecting the level of each species' negative ecological impact in California. Cal-IPC defines High as "species that have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically." (Cal-IPC 2021). The species found in the BSA that are listed on the Cal-IPC list as High are yellow starthistle (*Centaurea solstitialis*), medusa head (*Elymus caput-medusae*), fennel (*Foeniculum vulgare*), and Himalayan blackberry (*Rubus armeniacus*).

Within the BSA, these species will be removed to the extent possible where the vegetation will be disturbed by construction activities. Himalayan blackberry would be more difficult to eradicate given that it is common outside the BSA in nearby areas and upstream. A revegetation plan has not yet been developed for this project, but native plants will be utilized as part of the plan.

Regional Species and Habitats and Natural Communities of Concern

The species listed in the CDFW (2021), CNPS (2021), and USFWS (2021) records search results are discussed in Table 1. The printout of the USFWS list can be found in Appendix D. A description of habitat requirements is provided for each special-status plant or wildlife species along with an evaluation of its potential to occur within the BSA. Potential for

special-status species to occur in the BSA was determined according to the following criteria:

- Absent [A] - No habitat present and no further work needed.
- Habitat Present [HP] - Habitat is, or may be present. The species may be present.
- Present [P] - Species is present
- Critical Habitat [CH] – Proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

Based on these results, it was determined that 106 special-status plant species and 36 special-status wildlife species have been documented from or have a range that occurs in the Healdsburg, Jimtown, Mt. Saint Helena, Mark West Springs, Santa Rosa, Sebastopol, Camp Meeker, Guerneville, or Geyserville 7.5-minute USGS quadrangles. Of these species, 15 special-status plant species and 13 special-status wildlife species have documented occurrences within 8 kilometers (5 miles) of the BSA (CDFW 2021).

Maacama Creek is designated as critical habitat for both Central California Coast coho salmon and Central California Coast steelhead. Both species, and California Coastal Chinook salmon, have the potential to occur in the BSA during typical water year conditions. There are no barriers to fish passage downstream of the BSA that would prevent these species from migrating upstream to the area. Based on habitat and conditions within the BSA and documented occurrences nearby, it was determined that the BSA has potential to support nine special-status wildlife species identified in Table 1.

The proposed project involves the construction of a new bridge over Maacama Creek and the demolition of the existing, insufficient bridge. The project would not disrupt wildlife connectivity in the region. Only installation of scour countermeasures, specifically placement of rock slope protection and log rootwads, and installation of the stream diversion channel, would occur within the creek bed, and all work below top of bank would be limited to the dry season, between June 15 and October 15. Following the demolition of the existing bridge, the old bridge approach will be revegetated, and bank erosion control will be implemented, with improvement of complex stream habitat, in the form of permanent scour countermeasures.

Table 1: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Birds					
tricolored blackbird	*Agelaius tricolor*	ST, SSC	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.	A	The BSA is outside of the typical range of this species. There are no known occurrences of this species within 5 miles of the BSA.
great blue heron	*Ardea herodias*	none (breeding sites protected by CDFW); CDF sensitive	Year-round resident. Nests colonially or semi-colonially in tall trees and on cliffs, also sequestered terrestrial substrates. Breeding sites usually in close proximity to foraging areas: marshes, lake margins, tidal flats, and rivers. Forages primarily on fishes and other aquatic prey, also smaller terrestrial vertebrates.	A	Suitable rookery trees are absent from the BSA and immediate surrounds, however, this species may occasionally fly over the BSA.
burrowing owl	*Athene cunicularia*	SSC	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.	A	The wild oat grassland contains small mammal burrows, but not those of adequate size to support this species. Additionally, the grasses in this area are tall enough to obscure the openings of burrows from view. The BSA could not support this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
yellow rail	*Coturnicops noveboracensis*	SSC	Summer resident in eastern Sierra Nevada in Mono County, breeding in shallow freshwater marshes and wet meadows with dense vegetation. Also a rare winter visitor along the coast and other portions of the state. Extremely cryptic.	A	The BSA does not contain any freshwater marshes or wet meadows that this species requires.
white-tailed kite	*Elanus leucurus*	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	A	Areas within the BSA and immediately surrounding are low-density residential areas and agricultural fields. There is an open grassland within the BSA with scattered trees that could support the species. However, there are no documented occurrences of this species within 5-miles of the BSA. This species is unlikely to occur.
northern spotted owl	*Strix occidentalis caurina*	FT, ST, SSC	Year-round resident in dense, structurally complex coniferous and mixed (coniferous-hardwood) forests, usually those with old-growth conifers. Nests on platform-like substrates in the forest canopy, including in tree cavities. Preys on mammals.	A	Areas within the BSA and surrounding areas are low-density residential areas and agricultural fields. The BSA does not support dense, old growth conifers that this species requires for nesting.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Mammals					
pallid bat	*Antrozous pallidus*	SSC, WBWG: High	Found in a variety of habitats ranging from grasslands to mixed forests, favoring open and dry, rocky areas. Roost sites include crevices in rock outcrops and cliffs, caves, mines, and also hollow trees and various manmade structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	A	Areas within the BSA and immediately surrounding are low-density residential developments with no rock outcroppings or ranch type buildings to provide roosting sites. The bridge has exposed cracks and seams, but is regularly disturbed by vehicles and pedestrians, making the structure and the surrounding area unsuitable for the species. Further the bridge did not appear to support roosting currently or historically when inspected during the site visit.
Sonoma tree vole	*Arborimus pomo*	SSC	North coast fog belt from Oregon border to Sonoma County. Occurs In Douglas fir, redwood and montane hardwood-conifer forests. Feeds almost exclusively on Douglas fir needles. Will occasionally take needles of grand fir, hemlock or spruce.	A	The BSA does not contain the montane hardwood-conifer forests, specifically Douglas fir trees, which the species requires to survive. The BSA cannot support this species.
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC, WBWG: High	Associated with a wide variety of habitats from deserts to higher-elevation mixed and coniferous forests. Females form maternity colonies in buildings, caves and mines, and males roost singly or in small groups. Foraging typically occurs at edge habitats near wooded areas, e.g., along streams.	A	Areas within the BSA and immediately surrounding are low-density residential houses and agricultural fields. Additionally, there are no caves, mines or suitable, undisturbed openings in the BSA or especially within the bridge structure to support roosting by the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
western red bat	*Lasiurus blossevillii*	SSC, WBWG High	Highly migratory and typically solitary, roosting primarily in the foliage of trees or shrubs. Roosts are usually in broad-leaved trees including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas.	A	The riparian habitat within the BSA does not contain the broad-leaved trees that this species requires for roosting. The BSA does contain edge habitats that the species may forage, so the species may be observed in the BSA, but would not be likely to roost.
hoary bat	*Lasiurus cinereus*	WBWG: Medium	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths.	HP	The BSA contains large trees that could provide roosting habitat for this species. Additionally, the habitat mosaic along the riparian corridor could provide suitable foraging habitat. This species could occur within the BSA.
fringed myotis	*Myotis thysanodes*	WBWG High	Associated with a wide variety of habitats including dry woodlands, desert scrub, mesic coniferous forest, grassland, and sage-grass steppes. Buildings, mines and large trees and snags are important day and night roosts.	A	There are no snags present in or adjacent to the BSA to provide roosting habitat. The cracks within the bridge structure are too frequently disturbed and did not appear inhabited during the site visit. This species in unlikely to occur within the BSA.
Fisher	*Pekania pennanti*	SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	A	The BSA is outside of the known range of this species. Additionally, the BSA does not contain areas with mature, dense forest required to support this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
American badger	*Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are largely comprised of riparian woodland habitats. Friable soils which support the preferred prey for badgers and badger dens do not occur within the BSA.
Amphibians and Reptiles					
California tiger salamander – Sonoma County DPS	*Ambystoma californiense*	FE, ST	Inhabits grassland, oak woodland, ruderal and seasonal pool habitats. Adults are fossorial and utilize mammal burrows and other subterranean refugia. Breeding occurs primarily in vernal pools and other seasonal water features.	A	The BSA does not support ponds or vernal habitats which are necessary for the species to support breeding. The BSA also does not contain mammal burrows for this species to utilize.
California giant salamander	*Dicamptodon ensatus*	SSC	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent streams. Larvae usually remain aquatic for over a year.	HP	There are multiple occurrences of this species upstream of the BSA within the Maacama Creek watershed. The species has the ability to disperse into the BSA.
western pond turtle	*Emys marmorata*	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	HP	There are documented occurrences of this species within this watershed. The BSA contains open banks suitable for basking and could reside in the creek. The species is unlikely to nest within the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
foothill yellow-legged frog	*Rana boylii*	SC, SSC	Found in or adjacent to rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	HP	There are documented occurrences of this species within this watershed. The creek substrate is of suitable size for egg-laying and during a typical water year, flow would be adequate to support this species.
California red-legged frog	*Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Disperses through upland habitats after rains.	A	During a typical water year, water flow through the creek in the BSA would be too fast to support this species. Additionally, there are no occurrences of this species within the watershed.
red-bellied newt	*Taricha rivularis*	SSC	Inhabits coastal forests from southern Sonoma County northward, with an isolated population in Santa Clara County. Redwood forest provides typical habitat, though other forest types (e.g., hardwood) are also occupied. Adults are terrestrial and fossorial. Breeding occurs in streams, usually with relatively strong flow.	HP	There are occurrences of this species within the Maacama Creek watershed upstream of the BSA. This species could easily disperse

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Fishes					
Russian River tule perch	*Hysterocarpus traskii pomo*	SSC	Occurs in low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover and deep (> 1 m) pools.	HP	The BSA contains deep, covered pools where this species could reside. Additionally, the BSA is a tributary of the Russian River, and this species has been documented within Maacama Creek just downstream of the BSA (CDFW 2021).
Navarro roach	*Lavinia symmetricus navarroensis*	SSC	Occurs only in the Navarro River and its tributaries. Adaptable; found in warm, intermittent streams as well as cold, well-aerated streams.	A	The BSA is not part of the Navarro River or its tributaries. The BSA is outside the known range of this species.
hardhead	*Mylopharodon conocephalus*	SSC	Found in low to mid-elevation streams in the Sacramento-San Joaquin drainage; also occurs in the Russian River and tributaries. Favors clear, deep pools with sand-gravel-boulder bottoms and slow water velocity. Not found where exotic Centrarchids predominate.	A	The creek substrate in the BSA is larger than preferred for this species. Additionally, in a typical water year, water velocity would exceed that preferred for this species.
Chinook salmon – California Coastal ESU	*Oncorhynchus tshawytscha*	FT	California Coastal Chinook salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 degrees C lethal to adults.	HP	This species has been documented in Maacama Creek during recent salmonid surveys within the area (Sonoma RCD 2015).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
coho salmon - Central California Coast	*Oncorhynchus kisutch*	FE, SE	Central California Coast ESU federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	HP, CH	The creek is designated as critical habitat for the species. The species has not been documented in the creek during recent surveys, however it has been documented in Redwood Creek which enters Maacama Creek upstream of the BSA (California Sea Grant 2021).
steelhead - Central California Coast	*Oncorhynchus mykiss*	FT	Central California Coast DPS occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	HP, CH	The creek is designated as critical habitat for the Central California Coast DPS of this species. This species has been documented in the creek during salmonid surveys within the area (California Sea Grant 2021, CDFG 2006).
Invertebrates					
western bumble bee	*Bombus occidentalis*	SC	Formerly common throughout much of western North America; populations from southern British Columbia to central California have nearly disappeared. Occurs in a wide variety of habitat types. Nests are constructed annually in pre-existing cavities, usually on the ground (e.g., mammal burrows). Many plant species are visited and pollinated.	A	There are no documented occurrences of this species within 5 miles of the BSA. There were few mammal burrows observed during the site visit. It is unlikely that this species would occur in the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California freshwater shrimp	*Syncaris pacifica*	FE, SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	A	Although documented in the nearby Mark West Creek watershed, this species has not been documented within this watershed or the Study Area. Populations within the Mark West Creek watershed are declining.
Plants					
Sensitive Plants					
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	FE, Rank 1B.1	Marshes and swamps, riparian scrub. Elevation ranges from 15 to 1200 feet (5 to 365 meters). Blooms May-Jul.	A	While the Study Area contains riparian scrub, this species typically occurs in perennial wetlands which are absent.
Napa false indigo	*Amorpha californica var. napensis*	Rank 1B.2	Broadleafed upland forest, chaparral, cismontane woodland. Elevation ranges from 165 to 6560 feet (50 to 2000 meters). Blooms Apr-Jul.	HP	Moderate Potential. The Study Area contains oak forest habitat which may support this species.
Bent-flowered fiddleneck	*Amsinckia lunaris*	Rank 1B.2	Cismontane woodland, coastal bluff scrub, valley and foothill grassland. Elevation ranges from 10 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	HP	Moderate Potential. The Study Area contains grassland habitat which may support this species.
slender silver moss	*Anomobryum julaceum*	Rank 4.2	Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 330 to 3280 feet (100 to 1000 meters).	A	Unlikely. The Study Area does not contain coniferous forest.
Baker's manzanita	*Arctostaphylos bakeri* ssp. *bakeri*	SR, Rank 1B.1	Broadleafed upland forest, chaparral. Elevation ranges from 245 to 985 feet (75 to 300 meters). Blooms Feb-Apr.	A	Unlikely. The Study Area does not contain serpentine soils.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
The Cedars manzanita	*Arctostaphylos bakeri* ssp. *sublaevis*	SR, Rank 1B.2	Chaparral, closed-cone coniferous forest. Elevation ranges from 605 to 2495 feet (185 to 760 meters). Blooms Feb-May.	A	No Potential. The Study Area does not contain serpentine soils nor chaparral or closed-cone coniferous forest.
Vine Hill manzanita	*Arctostaphylos densiflora*	SE, Rank 1B.1	Chaparral. Elevation ranges from 165 to 395 feet (50 to 120 meters). Blooms Feb-Apr.	A	No Potential. The Study Area does not contain chaparral.
Howell's manzanita	*Arctostaphylos hispidula*	Rank 4.2	Chaparral. Elevation ranges from 395 to 4100 feet (120 to 1250 meters). Blooms Mar-Apr.	A	No Potential. The Study Area does not contain chaparral.
Konocti manzanita	*Arctostaphylos manzanita* ssp. *elegans*	Rank 1B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 1295 to 5300 feet (395 to 1615 meters). Blooms (Jan)Mar-May (Jul).	A	No Potential. The Study Area does not contain chaparral or coniferous forest.
Rincon Ridge manzanita	*Arctostaphylos stanfordiana* ssp. *decumbens*	Rank 1B.1	Chaparral, cismontane woodland. Elevation ranges from 245 to 1215 feet (75 to 370 meters). Blooms Feb-Apr (May).	A	No Potential. The Study Area does not contain chaparral.
serpentine milkweed	*Asclepias solanoana*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 755 to 6105 feet (230 to 1860 meters). Blooms May-Jul (Aug).	A	No Potential. The Study Area does not contain serpentine soils.
Brewer's milk-vetch	*Astragalus breweri*	Rank 4.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 2395 feet (90 to 730 meters). Blooms Apr-Jun.	A	Unlikely. While the Study Area contains seasonally wet grasslands, this species typically occurs on heavy or rocky soils which are absent.
Clara Hunt's milk-vetch	*Astragalus claranus*	FE, ST, Rank 1B.1	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 245 to 900 feet (75 to 275 meters). Blooms Mar-May.	A	Unlikely. While the Study Area contains seasonally wet grasslands, this species typically occurs on heavy or rocky soils which are absent.
Cleveland's milk-vetch	*Astragalus celvelandii*	Rank 4.3	Chaparral, cismontane woodland, riparian forest. Elevation ranges from 655 to 4920 feet (200 to 1500 meters). Blooms Jun-Sep.	A	No Potential. The Study Area does not contain serpentine soils.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Jepson's milk-vetch	*Astragalus rattanii* var. *jepsonianus*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 970 to 2295 feet (295 to 700 meters). Blooms Mar-Jun.	A	No Potential. The Study Area does not contain serpentine soils.
big-scale balsamroot	*Balsamorhiza macrolepis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 150 to 5100 feet (45 to 1555 meters). Blooms Mar-Jun.	A	Unlikely. While the Study Area contains woodland habitat, the canopy is dense which typically precludes this species.
Sonoma sunshine	*Blennosperma bakeri*	FE, SE, Rank 1B.1	Valley and foothill grassland, vernal pools. Elevation ranges from 35 to 360 feet (10 to 110 meters). Blooms Mar-May.	A	Unlikely. This species typically occurs on alluvial clay soils situated in valleys, which is absent in the Study Area.
narrow-anthered brodiaea	*Brodiaea leptandra*	Rank 1B.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 360 to 3000 feet (110 to 915 meters). Blooms May-Jul.	A	Unlikely. This species typically occurs in openings in woodland and chaparral underlain by rocky soils, which are absent in the Study Area.
Bolander's reed grass	*Calamagrostis bolanderi*	Rank 4.2	Bogs and fens, broadleafed upland forest, closed-cone coniferous forest, coastal scrub, marshes and swamps, meadows and seeps, north coast coniferous forest. Elevation ranges from 0 to 1495 feet (0 to 455 meters). Blooms May-Aug.	A	Unlikely. The Study Area does not contain perennial marsh habitat.
Thurber's reed grass	*Calamagrostis crassiglumis*	Rank 2B.1	Coastal scrub, marshes and swamps. Elevation ranges from 35 to 195 feet (10 to 60 meters). Blooms May-Aug.	A	Unlikely. The Study Area is not situated very close to the coast nor contains perennial marsh habitat.
serpentine reed grass	*Calamagrostis ophitidis*	Rank 4.3	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	A	No Potential. The Study Area does not contain serpentine soils.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Brewer's calandrinia	*Calandrinia breweri*	Rank 4.2	Chaparral, coastal scrub. Elevation ranges from 35 to 4005 feet (10 to 1220 meters). Blooms (Jan)Mar-Jun.	A	No suitable habitat. No further actions are recommended for this species.
The Cedars fairy-lantern	*Calochortus raichei*	Rank 1B.2	Chaparral, closed-cone coniferous forest. Elevation ranges from 655 to 1610 feet (200 to 490 meters). Blooms May-Aug.	A	No Potential. The Study Area does not contain serpentine soils.
pink star-tulip	*Calochortus uniflorus*	Rank 4.2	Coastal prairie, coastal scrub, meadows and seeps, north coast coniferous forest. Elevation ranges from 35 to 3510 feet (10 to 1070 meters). Blooms Apr-Jun.	HP	Moderate Potential. The Study Area contains seasonal wetland which may support this species.
Mt. Saint Helena moring-glory	*Calystegia collina* ssp. *oxyphylla*	Rank 4.2	Chaparral, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 915 to 3315 feet (279 to 1010 meters). Blooms Apr-Jun.	A	No Potential. The Study Area does not contain serpentine soils.
swamp harebell	*Campanula californica*	Rank 1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, marshes and swamps, meadows and seeps, north coast coniferous forest. Elevation ranges from 5 to 1330 feet (1 to 405 meters). Blooms Jun-Oct.	A	No suitable habitat. No further actions are recommended for this species.
Bristly sedge	*Carex comosa*	Rank 2B.1	Coastal prairie, marshes and swamps, valley and foothill grassland. Elevation ranges from 0 to 2050 feet (0 to 625 meters). Blooms May-Sep.	A	No Potential. The Study Area does not contain perennial marsh or swamp habitat.
johnny-nip	*Castilleja ambigua var. ambigua*	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	HP	Moderate Potential. The Study Area contains mesic grassland habitat.
Pitkin Marsh paintbrush	*Castilleja uliginosa*	SE, Rank 1A	Marshes and swamps. Elevation ranges from 785 to 785 feet (240 to 240 meters). Blooms Jun-Jul.	A	No Potential. The Study Area does not contain perennial wetlands.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Rincon Ridge ceanothus	*Ceanothus confuses*	Rank 1B.1	Chaparral, cismontane woodland, closed-cone coniferous forest. Elevation ranges from 245 to 3495 feet (75 to 1065 meters). Blooms Feb-Jun.	A	No Potential. The Study Area does not contain dry shrubby slopes.
Calistoga ceanothus	*Ceanothus divergens*	Rank 1B.2	Chaparral. Elevation ranges from 560 to 3115 feet (170 to 950 meters). Blooms Feb-Apr.	A	No Potential. The Study Area does not contain dry shrubby slopes.
Vine Hill ceanothus	*Ceanothus foliosus var. vineatus*	FE, SE, Rank 1B.1	Coastal prairie. Elevation ranges from 35 to 1000 feet (10 to 305 meters). Blooms Jun-Aug.	A	No Potential. The Study Area does not contain chaparral habitat.
glory brush	*Ceanothus gloriosus var. exaltatus*	Rank 4.3	Chaparral. Elevation ranges from 100 to 2000 feet (30 to 610 meters). Blooms Mar-Jun (Aug).	A	No Potential. The Study Area does not contain chaparral habitat.
holly-leaved ceanothus	*Ceanothus purpurpeus*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 395 to 2100 feet (120 to 640 meters). Blooms Feb-Jun.	A	No Potential. The Study Area does not contain chaparral nor rocky soils.
Sonoma ceanothus	*Ceanothus sonomensis*	Rank 1B.2	Chaparral. Elevation ranges from 705 to 2625 feet (215 to 800 meters). Blooms Feb-Apr.	A	No suitable habitat. No further actions are recommended for this species.
pappose tarplant	*Centromadia parryi* ssp. *parryi*	Rank 1B.2	Chaparral, coastal prairie, marshes and swamps, meadows and seeps, valley and foothill grassland. Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	HP	Moderate Potential. The Study Area contains seasonal wetlands in grasslands.
Vine Hill clarkia	*Clarkia imbricata*	FE, SE, Rank 1B.1	Chaparral, valley and foothill grassland. Elevation ranges from 165 to 245 feet (50 to 75 meters). Blooms Jun-Aug.	A	Unlikely. The Study Area does not contain chaparral habitat nor is it underlain by acidic sandy soil. Additionally, this species is restricted to western Sonoma County.
serpentine bird's-beak	*Cordylanthus tenuis* ssp. *brunneus*	Rank 4.3	Chaparral, cismontane woodland, closed-cone coniferous forest. Elevation ranges from 1000 to 3000 feet (305 to 915 meters). Blooms Jul-Aug.	A	No Potential. The Study Area does not contain serpentine soils.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Pennell's bird's-beak	*Cordylanthus tenuis* ssp. *capillaris*	FE, SR, Rank 1B.2	Chaparral, closed-cone coniferous forest. Elevation ranges from 150 to 1000 feet (45 to 305 meters). Blooms Jun-Sep.	A	No Potential. The Study Area does not contain serpentine soils.
serpentine cryptantha	Cryptantha dissita	Rank 1B.2	Chaparral. Elevation ranges from 1295 to 1905 feet (395 to 580 meters). Blooms Apr-Jun.	A	No Potential. The Study Area does not contain serpentine soils.
Peruvian dodder	*Cuscuta obtusiflora var. glandulosa*	Rank 2B.2	Marshes and swamps. Elevation ranges from 50 to 920 feet (15 to 280 meters). Blooms Jul-Oct.	A	No Potential. The Study Area does not contain perennial wetlands.
mountain lady's-slipper	*Cypripedium montanum*	Rank 4.2	Broadleafed upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 605 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	A	Unlikely. While the Study Area contains forest habitat, the understory contains dense shrub cover which likely precludes this species.
Baker's larkspur	*Delphinium bakeri*	FE, SE, Rank 1B.1	Broadleafed upland forest, coastal scrub, valley and foothill grassland. Elevation ranges from 260 to 1000 feet (80 to 305 meters). Blooms Mar-May.	A	Unlikely. While the Study Area contains woodland habitat, the species typically occurs on shale soils and is restricted to northwestern Marin County.
Golden larkspur	*Delphinium luteum*	FE, SR, CNPS 1B.1	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms Mar-May.	A	No suitable habitat. No further actions are recommended for this species.
swamp larkspur	*Delphinium uliginosum*	Rank 4.2	Chaparral, valley and foothill grassland. Elevation ranges from 1115 to 2000 feet (340 to 610 meters). Blooms May-Jun.	A	No Potential. The Study Area does not contain serpentine soils.
dwarf downingia	*Downingia pusilla*	Rank 2B.2	Valley and foothill grassland, vernal pools. Elevation ranges from 5 to 1460 feet (1 to 445 meters). Blooms Mar-May.	A	Unlikely. The Study Area does not contain vernal pool habitat
California bottle-brush grass	*Elymus californicus*	Rank 4.3	Broadleafed upland forest, cismontane woodland, north coast coniferous forest, riparian woodland. Elevation ranges from 50 to 1540 feet (15 to 470 meters). Blooms May-Aug(Nov).	A	Unlikely. The Study Area is outside the coastal environ.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
streamside daisy	*Erigeron biolettii*	Rank 3	Broadleafed upland forest, cismontane woodland, north coast coniferous forest. Elevation ranges from 100 to 3610 feet (30 to 1100 meters). Blooms Jun-Oct.	A	Unlikely. This species typically occurs in dry grasslands with rocky soils, growing out of rocks. This habitat is absent in the Study Area.
Greene's narrow-leaved daisy	*Erigeron greenei*	Rank 1B.2	Chaparral. Elevation ranges from 260 to 3295 feet (80 to 1005 meters). Blooms May-Sep.	A	No Potential. The Study Area does not contain chaparral habitat.
Snow Mountain buckwheat	*Eriogonum nervulosum*	Rank 1B.2	Chaparral. Elevation ranges from 985 to 6905 feet (300 to 2105 meters). Blooms Jun-Sep.	A	No Potential. The Study Area does not contain serpentine soils.
serpentine daisy	*Eriogonum serpentinus*	Rank 1B.3	Chaparral. Elevation ranges from 195 to 2200 feet (60 to 670 meters). Blooms May-Aug.	A	No Potential. The Study Area does not contain serpentine soils.
bay buckwheat	*Eriogonum umbellatum var. bahiiforme*	Rank 4.2	Cismontane woodland, lower montane coniferous forest. Elevation ranges from 2295 to 7220 feet (700 to 2200 meters). Blooms Jul-Sep.	A	No Potential. The Study Area does not contain serpentine soils.
slender cottongrass	*Eriophorum gracile*	Rank 4.3	Bogs and fens, meadows and seeps, upper montane coniferous forest. Elevation ranges from 4200 to 9515 feet (1280 to 2900 meters). Blooms May-Sep.	A	No Potential. The Study Area does not contain perennial wetlands underlain by acidic soils.
St. Helena fawn lily	*Erythronium helenae*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 1150 to 4005 feet (350 to 1220 meters). Blooms Mar-May.	HP	Moderate Potential. The Study Area contains woodland habitat which may support this species.
Fragrant fritillary	*Fritillaria liliacea*	USFSS, Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 10 to 1345 feet (3 to 410 meters). Blooms Feb-Apr.	A	Unlikely. While the Study Area contains woodland and grassland habitat, this species typically occurs on heavy clay soils which are absent.
Purdy's fritillary	*Fritillaria purdyi*	Rank 4.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 575 to 7400 feet (175 to 2255 meters). Blooms Mar-Jun.	A	Unlikely. While the Study Area contains woodland habitat, this species typically occurs on rocky or serpentine soils which are absent.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Woolly-headed gilia	*Gilia capitata* ssp. *tomentosa*	Rank 1B.1	Coastal bluff scrub, valley and foothill grassland. Elevation ranges from 35 to 720 feet (10 to 220 meters). Blooms May-Jul.	A	No Potential. The Study Area does not contain rocky outcrops nor serpentine soils.
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	SE, Rank 1B.2	Marshes and swamps, vernal pools. Elevation ranges from 35 to 7790 feet (10 to 2375 meters). Blooms Apr-Aug.	A	No Potential. The Study Area does not contain vernal pool habitat nor lake margins.
nodding harmonia	*Harmonia nutans*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 245 to 3200 feet (75 to 975 meters). Blooms Mar-May.	A	Unlikely. The Study Area does not contain rocky areas.
serpentine sunflower	*Helianthus exilis*	Rank 4.2	Chaparral, cismontane woodland. Elevation ranges from 490 to 5005 feet (150 to 1525 meters). Blooms Jun-Nov.	A	No Potential. The Study Area lacks serpentine soils. Additionally, this species was recently lumped into *H. bolanderi* and is not considered a valid taxon.
congested-headed hayfield tarplant	*Hemizonia congesta* ssp. *congesta*	Rank 1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	HP	Moderate Potential. The Study Area contains grassland habitat which may support this species.
two-carpellate western flax	*Hesperolinon bicarpellatum*	Rank 1B.2	Chaparral. Elevation ranges from 195 to 3295 feet (60 to 1005 meters). Blooms (Apr)May-Jul.	A	No Potential. The Study Area does not contain serpentine soils.
hogwallow starfish	*Hesperevax caulescens*	Rank 4.2	Valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1655 feet (0 to 505 meters). Blooms Mar-Jun.	A	No Potential. The Study Area does not contain vernal pools nor clay soils.
thin-lobed horkelia	*Horkelia tenuiloba*	Rank 1B.2	Broadleafed upland forest, chaparral, valley and foothill grassland. Elevation ranges from 165 to 1640 feet (50 to 500 meters). Blooms May-Jul (Aug).	HP	Moderate Potential. The Study Area contains mesic grassland habitat underlain by sandy loam soils.5

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
harlequin lotus	*Hosackia gracilis*	Rank 4.2	Broadleafed upland forest, cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, meadows and seeps, north coast coniferous forest, valley and foothill grassland. Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms Mar-Jul.	HP	Moderate Potential. The Study Area contains mesic grassland habitat underlain by sandy loam soils.
coast iris	*Iris longipetala*	Rank 4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms Mar-May (Jun).	A	Unlikely. The Study Area does not contain heavy clay soils.
Small groundcone	*Kopsiopsis hookeri*	Rank 2.3	North coast coniferous forest. Elevation ranges from 295 to 2905 feet (90 to 885 meters). Blooms Apr-Aug.	A	No Potential. The Study Area does not contain coniferous forest habitat.
Colusa layia	*Layia septentrionalis*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 330 to 3595 feet (100 to 1095 meters). Blooms Apr-May.	A	Unlikely. While the Study Area contains woodland habitat, this species typically occurs in rocky soils which are absent.
Burke's goldfields	*Lasthenia burkei*	FE, SE, Rank 1B.1	Meadows and seeps, vernal pools. Elevation ranges from 50 to 1970 feet (15 to 600 meters). Blooms Apr-Jun.	A	Unlikely. The Study Area does not contain vernal pool habitat.
Baker's goldfields	*Lasthenia californica* ssp. *bakeri*	Rank 1B.2	Closed-cone coniferous forest, coastal scrub, marshes and swamps, meadows and seeps. Elevation ranges from 195 to 1705 feet (60 to 520 meters). Blooms Apr-Oct.	A	Unlikely. The Study Area is not situated very near the coast nor contains perennial wetland habitat.
legenere	*Legenere limosa*	Rank 1B.1	Vernal pools. Elevation ranges from 5 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	A	The BSA lacks vernal pool habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
bristly leptosiphon	*Leptosiphon acicularis*	Rank 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	HP	Moderate Potential. The Study Area contains openings in oak woodland which may support this species.
Jepson's leptosiphon	*Leptosiphon jepsonii*	Rank 1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 330 to 1640 feet (100 to 500 meters). Blooms Mar-May.	HP	Moderate Potential. The Study Area contains woodland habitat underlain by volcanic soils.
broad-lobed leptosiphon	*Leptosiphon latisectus*	Rank 4.3	Broadleafed upland forest, cismontane woodland. Elevation ranges from 560 to 4920 feet (170 to 1500 meters). Blooms Apr-Jun.	HP	Moderate Potential. The Study Area contains openings in oak woodland which may support this species.
Crystal Springs lessingia	*Lessingia arachnoidea*	Rank 1B.2	Cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 195 to 655 feet (60 to 200 meters). Blooms Jul-Oct.	A	No Potential. The Study Area does not contain serpentine soils.
woolly-headed lessingia	*Lessingia hololeuca*	Rank 3	Broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	A	No Potential. The Study Area does not contain serpentine soils.
Pitkin Marsh lily	*Lilium pardalinum ssp. pitkinense*	FE, SE, Rank 1B.1	Cismontane woodland, meadows and seeps, marshes and swamps (freshwater), mesic and sandy. 35-65 m. Flowers June-July.	A	No Potential. The Study Area does not contain marsh habitat.
redwood lily	*Lilium rubescens*	Rank 4.2	Broadleafed upland forest, chaparral, lower montane coniferous forest, north coast coniferous forest, upper montane coniferous forest. Elevation ranges from 100 to 6265 feet (30 to 1910 meters). Blooms Apr-Aug (Sep).	A	Unlikely. While the Study Area contains forest habitat, the understory contains dense shrub cover which likely precludes this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sebastopol meadowfoam	*Limnanthes vinculans*	FE, SE, Rank 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Apr-May.	A	Unlikely. The Study Area does not contain valley oak savanna habitat nor vernal pools.
Napa lomatium	*Lomatium repostum*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 295 to 3380 feet (90 to 1030 meters). Blooms Mar-Jun.	A	No Potential. The Study Area does not contain rocky areas.
Cobb Mountain lupine	*Lupinus sericatus*	Rank 1B.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 900 to 5005 feet (275 to 1525 meters). Blooms Mar-Jun.	A	No Potential. The Study Area does not contain rocky areas.
green monardella	*Monardella viridis*	Rank 4.3	Broadleafed upland forest, chaparral, cismontane woodland. Elevation ranges from 330 to 3315 feet (100 to 1010 meters). Blooms Jun-Sep.	A	No Potential. The Study Area does not contain rocky areas which may support this species.
Marsh microseris	*Microseris paludosa*	Rank 1B.2	Cismontane woodland, closed-cone coniferous forest, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun (Jul).	HP	Moderate Potential. The Study Area contains forest and grassland habitat which may support this species.
cotula navarretia	*Navarretia cotulifolia*	Rank 4.2	Chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 15 to 6005 feet (4 to 1830 meters). Blooms May-Jun.	A	No Potential. The Study Area does not contain heavy clay soils or serpentine soils.
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation ranges from 15 to 5710 feet (5 to 1740 meters). Blooms Apr-Jul.	A	Unlikely. The Study Area does not contain heavy clay soils nor vernal pool habitat.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
many-flowered navarretia	*Navarretia leucocephala* ssp. *plieantha*	FE, SE, Rank 1B.2	Vernal pools. Elevation ranges from 100 to 3115 feet (30 to 950 meters). Blooms May-Jun.	A	No Potential. The Study Area does not contain soils derived of volcanic ash nor vernal pools.
Sonoma beardtongue	*Penstemon newberryi* var. *sonomensis*	Rank 1B.3	Chaparral. Elevation ranges from 2295 to 4495 feet (700 to 1370 meters). Blooms Apr-Aug.	A	No Potential. The Study Area does not contain rock outcrops.
Gairdner's yampah	*Perideridia gairdneri* ssp. *gairdneri*	Rank 4.2	Broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 2000 feet (0 to 610 meters). Blooms Jun-Oct.	A	Unlikely. The Study Area does not contain heavy clay soils.
white-flowered rein orchid	*Piperia candida*	Rank 1B.2	Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 100 to 4300 feet (30 to 1310 meters). Blooms (Mar)May-Sep.	A	No Potential. The Study Area does not contain coniferous forest with abundant duff necessary to support this species. Additionally, this species is more typical in coastal forests.
North coast semaphore grass	*Pleuropogon hooverianus*	ST, Rank 1B.1	Broadleafed upland forest, meadows and seeps, north coast coniferous forest. Elevation ranges from 35 to 2200 feet (10 to 671 meters). Blooms Apr-Jun.	A	Unlikely. While the Study Area contains forest habitat, there are no wetlands within the forest habitat which may support this species.
Lobb's aquatic buttercup	*Ranunculus lobbii*	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 50 to 1540 feet (15 to 470 meters). Blooms Feb-May.	A	Unlikely. While the Study Area contains seasonal wetland habitat, clay soils are absent.
white beaked-rush	*Rhynchospora alba*	Rank 2B.2	Bogs and fens, marshes and swamps, meadows and seeps. Elevation ranges from 195 to 6695 feet (60 to 2040 meters). Blooms Jun-Aug.	A	No Potential. The Study Area does not contain perennial marsh habitat.
California beaked-rush	*Rhynchospora californica*	Rank 1B.1	Bogs and fens, lower montane coniferous forest, marshes and swamps, meadows and seeps. Elevation ranges from 150 to 3315 feet (45 to 1010 meters). Blooms May-Jul.	A	No Potential. The Study Area does not contain perennial marsh habitat.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
brownish beaked-rush	*Rhynchospora capitellata*	Rank 2B.2	Lower montane coniferous forest, marshes and swamps, meadows and seeps, upper montane coniferous forest. Elevation ranges from 150 to 6560 feet (45 to 2000 meters). Blooms Jul-Aug.	A	No Potential. The Study Area does not contain perennial marsh habitat.
round-headed beaked-rush	*Rhynchospora globularis*	Rank 2B.1	Marshes and swamps. Elevation ranges from 150 to 195 feet (45 to 60 meters). Blooms Jul-Aug.	A	No Potential. The Study Area does not contain perennial marsh habitat.
Kenwood Marsh checkerbloom	*Sidalcea oregana* ssp. *valida*	FE, SE, Rank 1B.1	Marshes and swamps. Elevation ranges from 375 to 490 feet (115 to 150 meters). Blooms Jun-Sep.	A	No Potential. The Study Area does not contain perennial marsh habitat.
Freed's jewelflower	*Streptanthus brachiatus* ssp. *hoffmanii*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 1610 to 4005 feet (490 to 1220 meters). Blooms May-Jul.	A	No Potential. The Study Area does not contain serpentine soils.
northern slender pondweed	*Stuckenia filiformis* ssp. *alphina*	Rank 2B.2	Marshes and swamps. Elevation ranges from 985 to 7055 feet (300 to 2150 meters). Blooms May-Jul.	A	No Potential. The Study Area does not contain perennial marsh habitat.
two-fork clover	*Trifolium amoenum*	FE, Rank 1B.1	Coastal bluff scrub, valley and foothill grassland. Elevation ranges from 15 to 1360 feet (5 to 415 meters). Blooms Apr-Jun.	HP	Moderate Potential. The Study Area contains grassland habitat with known associated species.
Santa Cruz clover	*Trifolium buckwestiorum*	Rank 1B.1	Broadleafed upland forest, cismontane woodland, coastal prairie. Elevation ranges from 345 to 2000 feet (105 to 610 meters). Blooms Apr-Oct.	A	Unlikely. While the Study Area contains moist grassland habitat, the soils are not gravelly.
Saline clover	*Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	A	Unlikely. The Study Area does not contain alkaline grassland habitat.
Coastal triquetrella	*Triquetrella californica*	Rank 1B.2	Coastal bluff scrub, coastal scrub. Elevation ranges from 35 to 330 feet (10 to 100 meters).	A	No Potential. The Study Area is not located very near the coast.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Methuselah's beard lichen	*Usnea longissima*	Rank 4.2	Broadleafed upland forest, north coast coniferous forest. Elevation ranges from 165 to 4790 feet (50 to 1460 meters).	A	Unlikely. The Study Area does not contain coniferous forest.
oval-leaved viburnum	*Viburnum ellipticum*	Rank 2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 705 to 4595 feet (215 to 1400 meters). Blooms May-Jun.	HP	Moderate Potential. The Study Area contains woodland habitat which may support this species.

* Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
MMPA	Species protected under the Marine Mammal Protection Act
SE	State Endangered
ST	State Threatened
SR	State Rare
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group (High or Medium) Priority species
BLMS	Bureau of Land Management Sensitive Species
USFSS	U.S. Forest Service Sensitive Species
CNPS 1A	CNPS Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CNPS 1B	CNPS Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
CNPS 2A	CNPS Rare Plant Rank 2A: Plants presumed extirpated in California, but more common elsewhere
CNPS 2B	CNPS Rare Plant Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
CNPS 3	CNPS are Plant Rank 3: Plants about which more information is needed – a review list
CNPS 4	CNPS Rare Plant Rank 4: Plants of limited distribution – a watch list

CNPS Rare Plant Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

*Presence:
Absent [A] - no habitat present and no further work needed.
Habitat Present [HP] -habitat is, or may be present. The species may be present.
Present [P] - the species is present.
Critical Habitat [CH] - proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is *present.*

Chapter 4 – Results: Biological Resources, Discussion of Impacts and Mitigation

Habitats and Natural Communities of Special Concern

Habitats are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals occurring on site. Eight natural communities of special concern were found to be present in the BSA: California Bay Riparian, Perennial Stream, Arroyo Willow Thicket, Valley Oak Woodland, Valley Oak-Oregon Ash Woodland, Coast Live Oak Woodland, Potential Seasonal Wetlands, and Mixed Oak Woodland.

The impact areas and lengths are summarized in Table 2 and shown in Appendix A, Figure 3B. Permanent impacts include reconstruction of the intersection of Young Road and Chalk Hill Road, construction of the new bridge and its support structures, construction of new bridge approach roadways, vegetation removal, and demolition of the existing bridge. Temporary impacts are disturbances to existing natural communities that would be restored to the same natural community type following construction.

Table 2: Proposed Project Direct Impacts to Natural Communities of Special Concern.

Natural Community of Special Concern	Permanent Impacts (acres/ linear feet (LF))	Temporary Impacts (acres/LF)
Seasonal Wetland	0	0
Perennial Stream	0.06 (122 LF)	0.11 (263 LF)
Mixed Oak Woodland	0	<0.01
California Bay Riparian	0	<0.01
Valley Oak Woodland	0.11	0.09
Valley Oak-Oregon Ash Woodland	0.02	0.01
Purple Needlegrass Grassland	0	0.12
Total	0.19 (122 LF)	0.35 (263 LF)

The project will not impact the seasonal wetland located to the southern the portion of the BSA. The following sections present a discussion of the impacts and mitigation for the other natural communities of special concern.

PERENNIAL STREAM

Perennial Stream Survey Results

The Perennial Stream Biological Community consists of the Maacama Creek stream bed, which extends approximately 560 linear feet (LF) through the BSA and covers

approximately 1.05 acres. The creek is a tributary of the Russian River and receives runoff from the local watershed which holds many agricultural lands. The creek substrate is a mix of cobble and gravel with some larger boulders. Indicators of OHWM include a shift in vegetation and scour along the bank. The channel width at the OHWM was used to determine the stream boundary shown in Figure 2 of Appendix A. Severe erosion along the southern bank has caused the top of bank to degrade to a sheer rock face approximately 30 feet high along the extent of Chalk Hill Road Bridge. The northern bank of Maacama Creek has a more gradual slope. A formal wetland delineation was performed in November 2022, to determine the locations of potential wetlands and clarify the extent of federal and state jurisdictional waters. The delineation report is included in Appendix G.

Perennial Stream Avoidance and Minimization Efforts

The following measures are included to avoid impacts to creek habitat resulting from the use of mechanical equipment in the creek bed.

- Any work below top of bank will be limited to the dry season, between June 15 and October 15.
- Final grading in the creekbed will conform to the existing creek channel at the downstream and upstream ends of the work.
- Regulatory approval will be obtained for work within potential jurisdictional areas, including permitting as needed from USACE, RWQCB, and CDFW. All work within these areas will conform to any conditions imposed by the regulating agencies.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas and to prevent any equipment from unnecessarily extending the work area or entering the creekbed. In addition, silt fencing will be installed where appropriate to prevent debris from entering the creek. All fencing will be removed upon project completion.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material will be in place underneath equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, will occur outside the creek's top-of-bank. Any hazardous chemical spills will be cleaned immediately.
- All drilling muds and fluid will be contained in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities will be collected and not allowed to flow into the creek.
- No equipment, including concrete trucks, will be washed within the channel of the creek, or where wash water could flow into the channel. Prior to proposed project construction, the contractor will establish a concrete washout area for concrete trucks in a location where wash water will not enter the creek or adjacent areas. The washout area will follow the practices outlined in the San Francisco Bay RWQCB Erosion and Sediment Control Field Manual (page 107-108, July 1999) or more recent guidelines. Substitution of the designated concrete washout area or methods will require prior approval from the County of Sonoma.
- All water that comes in contact with wet concrete will be pumped directly into tanks and disposed of at a permitted location.

- When working on the roadway and bridge approaches during the wet season, all drainage inlets within the proposed project site will be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the BSA are deposited in covered or closed trash containers. The trash containers will not be left open and unattended overnight.
- During the year after construction, the proposed project site will be inspected during the rainy season. Areas of significant erosion or erosion control device failure will be noted and appropriate remedial actions taken.

With the implementation of these measures, it is expected that the proposed project will not result in adverse impacts to creek habitat.

Perennial Stream Project Impacts

As summarized in Table 2 above, there will be 0.06 acre (122 LF) of permanent impacts and 0.11 acre (263 LF) of temporary impacts.

Temporary impacts would result from installation of the stream diversion system, grading of the channel upon project completion to return to normal grade, construction of the access ramps, erecting falsework to support the new bridge framework before the abutments are fully secured, and installation of log rootwads as part of the scour countermeasures on the southern streambank. Permanent impacts to the stream would result from shading impacts to riparian vegetation from construction of the new bridge and the installation of vegetated rock slope protection as part of the scour countermeasures on the southern stream bank. Habitat benefits from the project include the installation of log rootwads to improve salmonid resting and rearing habitat within the creek, and new riparian vegetation establishment in the footprint of the demolished and removed existing bridge.

Perennial Stream Compensatory Mitigation

A total of 0.11 acre (263 LF) of temporary impacts and 0.06 acre (122 LF) of permanent impacts to this natural community are anticipated as a result of the proposed project. Upon completion of the project, the stream diversion system will be removed, and the creek bed will be regraded to conform to its natural contours. Shading of riparian vegetation will occur from construction of the new bridge across the channel, offset by demolition and removal of the existing bridge, allowing for the establishment and growth of new riparian vegetation. The permanent scour countermeasures include the installation of vegetated rock slope protection with log rootwads to provide for the formation of important fish resting and rearing habitat within the creek. The earthen creek banks and rock slope protection area will be revegetated with native vegetation. With the project design's minimal impacts to the stream channel and riparian habitats, and long-term benefits from habitat improvements included in the design, no additional compensatory mitigation is proposed.

Perennial Stream Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

MIXED OAK WOODLAND

Mixed Oak Woodlands Survey Results

The Mixed Oak Woodland meets the definition of the *Quercus* Forest & Woodland Alliance as defined by Sikes et al. 2021. Coast live oak (*Quercus agrifolia),* blue oak *(Quercus douglasii),* and valley oak (*Quercus lobata)* are equally dominant in the canopy. Although this community has an S4 ranking which would not denote it as a community of special concern, Sonoma County considers all oak dominated communities as sensitive communities under their Municipal Code. Approximately 1.20 acre of this community is present within the BSA.

Mixed Oak Woodlands Avoidance and Minimization Efforts

The following avoidance and minimization measures will be employed to avoid or minimize impacts to the greatest extent possible:

- Work will be confined to the areas needed for construction.
- Appropriate BMPs would be used during construction.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility fencing would be installed along the limits of work to prevent encroachment into undisturbed habitats.

Mixed Oak Woodlands Project Impacts and Mitigation

As summarized in Table 2 above, there will be <0.01 acres of temporary impact to Mixed Oak Woodlands. The Mixed Oak Woodlands will be on the outer edge of the construction staging area. Areas that have been temporarily disturbed by construction will be restored with native, non-invasive species after construction. No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

CALIFORNIA BAY RIPARIAN

California Bay Riparian Survey Results

The California Bay Riparian Woodland meets the definition of the *Umbellularia californica* Forest & Woodland Alliance (G4, S3) and is considered a sensitive community (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). The overstory of this community is composed of California bay trees (*Umbellularia californica*) with an understory of common snowberry (*Symphoricarpos albus var. laevigatus*) and California wild grape (*Vitis californica*). This is not a strictly riparian community. For the purpose of this document, the modifier “riparian” is intended to describe the type of woodland (indicating the slightly more mesic conditions within the creek’s general influence). Approximately 0.11 acre of this community is present within the BSA.

California Bay Avoidance and Minimization Measures

The following avoidance and minimization measures will be employed to avoid or minimize impacts to the greatest extent possible:

- Work will be confined to the areas needed for construction.

- Appropriate BMPs would be used during construction.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility fencing would be installed along the limits of work to prevent encroachment into undisturbed habitats.

California Bay Impacts and Mitigation

As summarized in Table 2 above, there will be 0.01 acre of temporary impacts to California Bay Riparian Woodlands. This would be a result of the temporary excavation support encroaching into the area. These supports would be removed after construction. Additionally, one tree is anticipated to be removed within this community to allow for access to the construction area. Depending on the species of tree that will be removed, the tree must be replaced in accordance with the regulations set forth by the Sonoma County Municipal Code. A revegetation plan for this project has not yet been established, but this requirement will be considered during its formation. No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

VALLEY OAK WOODLAND

Valley Oak Woodland Survey Results

The Valley Oak Woodland meets the definition of the *Quercus lobata* Woodland Alliance (S3G3) and is considered a sensitive community (Buck-Diaz et al. 2021). Despite its close proximity to the creek on the southern bank, the woodland is not considered riparian due to the drastic change in elevation between the creek and the woodland. Approximately 0.94 acre of this community is present in the BSA.

Valley Oak Woodland Avoidance and Minimization Measures

The following avoidance and minimization measures will be employed to avoid or minimize impacts to the greatest extent possible:

- Work will be confined to the areas needed for construction.
- Appropriate BMPs would be used during construction.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility fencing would be installed along the limits of work to prevent encroachment into undisturbed habitats.

Valley Oak Woodland Impacts and Mitigation

As summarized in Table 2 above, there will be 0.09 acre of temporary impacts and 0.11 acre of permanent impacts to the Valley Oak Woodlands as a result of project activities. Temporary impacts would result from erosion control and revegetation along the new bridge approaches and from construction of temporary excavation support structures. Permanent impacts would be incurred as a result of the new bridge approaches. The new alignment of Chalk Hill Road will pass through existing Valley Oak Woodlands. The revegetation plan will ensure that all oaks be replaced in kind or in accordance with the stipulations set forth by the Sonoma County Municipal Code and that all vegetation be

replaced. No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

VALLEY OAK – OREGON OAK WOODLAND

Valley Oak – Oregon Ash Woodland Survey Results

The Valley Oak – Oregon Ash Woodland meets the definition of the *Quercus lobata* Riparian Forest & Woodland Alliance (S3G3) and is considered sensitive habitat (CDFW 2021b). Himalayan blackberry and California wild grape are the dominant understory cover. Approximately 0.39 acre of this community is present within the BSA.

Valley Oak-Oregon Ash Woodland Avoidance and Minimization Measures

The following avoidance and minimization measures will be employed to avoid or minimize impacts to the greatest extent possible:

- Work will be confined to the areas needed for construction.
- Appropriate BMPs would be used during construction.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility fencing would be installed along the limits of work to prevent encroachment into undisturbed habitats.

Valley Oak – Oregon Ash Woodland Impacts and Mitigation

As summarized in Table 2 above, there will be 0.01 acre of temporary impacts and 0.02 acre of permanent impacts to Valley Oak – Oregon Ash Woodland as a result of the proposed project. Temporary impacts will result from the construction of temporary excavation supports to remove the existing bridge. Permanent impacts will result from the construction of the new bridge approach and the new alignment of Chalk Hill Road. One tree is anticipated to be removed within this community. The revegetation plan will ensure that all oaks be replaced in kind or in accordance with the stipulations set forth by the Sonoma County Municipal Code and that all vegetation be replaced. No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

PURPLE NEEDLEGRASS GRASSLAND

The Purple Needlegrass Grassland meets the membership rules of the Purple Needlegrass Grassland Alliance and Association (Klein et. al. 2015; CNPS 2021) and is considered sensitive habitat (CDFW 2021b). Approximately 0.26 acre of this community is present within the BSA.

Purple Needlegrass Grassland Avoidance and Minimization Measures

The following avoidance and minimization measures will be employed to avoid or minimize impacts to the greatest extent possible:

- Work will be confined to the areas needed for construction.

- Appropriate BMPs would be used during construction.
- Prior to clearing, grubbing, pruning, or groundbreaking activity, the limits of construction will be fenced with temporary high-visibility fencing would be installed along the limits of work to prevent encroachment into undisturbed habitats.

Purple Needlegrass Grassland Impacts and Mitigation

As summarized in Table 2 above, there will be 0.12 acre of temporary impacts as a result of the proposed project. Temporary impacts will result from the staging of construction materials and equipment. The revegetation plan will ensure that all oaks be replaced in kind or in accordance with project permits and the stipulations set forth by the Sonoma County Municipal Code, and that all vegetation be replaced. No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

Special Status Plant Species

One hundred seven special-status plant species have been documented in the CNDDB and CNPS records as potentially occurring in the quadrangles searched noted in a review of other resources as having overlapping ranges and habitat requirements (Table 1). Suitable habitat is present in the BSA for 15 of the species as described in Table 1. Key points regarding these species are summarized below.

- Napa false indigo (*Amorpha californica var. napensis*, Rank 1B.2). Oak forest within the BSA could support this species.
- Bent-flowered fiddleneck (*Amsinckia lunaris,* Rank 1B.2). The BSA contains grassland habitat which may support this species.
- pink star-tulip (*Calochortus uniflorus*, Rank 4.2) The Study Area contains seasonal wetland which may support this species.
- johnny-nip (*Castilleja ambigua var. ambigua,* Rank 4.2). The BSA contains mesic grassland habitat which may support this species.
- pappose tarplant (*Centromadia parryi* ssp. *parryi,* Rank 1B.2). The BSA contains seasonal wetlands in grasslands which may support this species.
- St. Helena fawn lily (*Erythronium helenae,* Rank 4.2). The BSA contains woodland habitat which may support this species.
- congested-headed hayfield tarplant (*Hemizonia congesta* ssp*. congesta*, Rank 1B.2). The BSA contains grassland habitat which may support this species.
- thin-lobed horkelia (*Horkelia tenuiloba,* Rank 1B.2). The BSA contains mesic grassland habitat underlain by sandy loam soils which may support this species.
- harlequin lotus (*Hosackia gracilis*, Rank 4.2). The BSA contains mesic grassland habitat underlain by sandy loam soils which may support this species.
- bristly leptosiphon (*Leptosiphon acicularis,* Rank 4.2) The Study Area contains openings in oak woodland which may support this species.
- Jepson's leptosiphon (*Leptosiphon jepsonii*, Rank 1B.2). The BSA contains woodland habitat underlain by volcanic soils which may support this species.

- broad-lobed leptosiphon (*Leptosiphon latisectus*, Rank 4.3) The Study Area contains openings in oak woodland which may support this species.
- Marsh microseris (*Microseris paludosa*, Rank 1B.2). The BSA contains forest and grassland habitat which may support this species.
- two-fork clover (*Trifolium amoenum*, FE, Rank 1B.1). The BSA contains grassland habitat with known associated species.
- oval-leaved viburnum (*Viburnum ellipticum,* Rank 2B.3). The BSA contains woodland habitat which may support this species.

The remaining special-status plant species documented in the vicinity are unlikely to occur in the BSA based on lack of suitable habitats (such as coastal dunes, coastal prairie, coastal salt marsh, or vernal pools) or specific substrates (i.e. serpentine, volcanic rock).

Targeted special-status plant surveys have not yet been performed. These surveys are planned for Spring 2022. Potential impacts to special-status plants will be re-evaluated following these floristic surveys

Special-Status Wildlife Species

Thirty-six special-status wildlife species have been documented in the CNDDB and USFWS records as potentially occurring in the quadrangles or noted in a review of other resources as having overlapping ranges and habitat requirements (Table 1). Fifteen of these special-status wildlife species have been documented in CNDDB within 5 miles of the BSA (CDFW 2021), and a total of seven species have a moderate or high potential to occur based upon habitat conditions present in the BSA and documented ranges. No special-status wildlife species were observed within the BSA during the site visit. Those species with potential to occur include: hoary bat (*Lasiurus cinereus*), western pond turtle (*Emys marmorata*), foothill yellow-legged frog (*Rana boylii*), Russian River tule perch (*Hysterocarpus traskii pomo*), Chinook salmon – California Coastal evolutionarily significant unit (ESU) (*Oncorhynchus tshawytscha*), Coho salmon - Central California Coast ESU (*Oncorhynchus kisutch*), and steelhead - Central California Coast distinct population segment (DPS) (*Oncorhynchus mykiss*).

The remaining 21 species identified in Table 1 are unlikely to occur within the BSA because of existing conditions within and surrounding the BSA. Roadways, residential development, and various anthropogenic disturbances greatly reduce the amount of available breeding, rearing, and foraging habitat for most special-status species. Several habitat types or habitat conditions that are required to support special-status wildlife species are also absent from the BSA, such as marsh, old growth forests, caves, and coastal habitats.

While there are cracks in the bridge abutment structures that could be utilized by special status bat species, the frequent traffic along the bridge would preclude any establishment of roosting colonies. Additionally, no evidence of bat occupation was observed during the September 14, 2021, site visit. Bats occupying the BSA would be limited to utilizing the trees surrounding the riparian area.

SPECIAL-STATUS BAT SPECIES

Hoary bat (*Lasiurus cinereum*, WBWG Medium Priority) are highly associated with forested habitats in the western United States, particularly in the Pacific Northwest. They are a solitary species and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches, usually at the edge of a clearing. Roosts are typically 10 to 30 feet above the ground. They have also been documented roosting in caves, beneath rock ledges, in woodpecker holes, in grey squirrel nests, under driftwood, and clinging to the side of buildings, though this behavior is not typical. Hoary bats are thought to be highly migratory, however, wintering sites and migratory routes have not been well documented. This species tolerates a wide range of temperatures and has been captured at air temperatures between 0 and 22 degrees Celsius. Hoary bats probably mate in the fall, with delayed implantation leading to birth in May through July. They usually emerge late in the evening to forage, typically from just over one hour after sunset to after midnight. This species reportedly has a strong preference for moths, but is also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps (WBWG 2015).

Survey Results

The BSA supports a matrix of woodland habitats around Maacama Creek. The Valley Oak Upland Woodland that borders the creek on the southwestern edge of the existing bridge and the Mixed Oak Woodland on the southwestern border of the BSA (Figure 2) offer suitable habitat for this species to roost during the day. At night this species could forage over the creek and throughout the wild oat grassland area to the south. No bats were directly observed during the September 14, 2021, site visit.

Bat Avoidance and Minimization

The following measures are recommended to avoid impacts to active roosts of both hoary bat and other non-status bat species:

- To the extent feasible, any tree removal or trimming should be conducted outside of the bat maternity season (generally April through October). If this work window is not feasible, preconstruction bat roost assessments conducted by a qualified biologist at least 14 days and no more than 30 days prior to removal are recommended to determine if bats roosts are present that may be impacted by Project activities. If special-status bat species or maternity roosts are detected during these surveys, additional measures including avoidance of the roost sites until the end of the maternity roosting season may be recommended.
- Regardless of the timing of tree removal or trimming activities, all felled trees or large limbs should remain on the ground for at least 24-hours prior to chipping, off-site removal, or other processing to allow any roosting individual bats to vacate the premises of their own volition.

Bat Project Impacts

As summarized in Figure 2, 0.10 acre of temporary impacts and 0.13 acre of permanent impacts to bat habitat are anticipated. Bat habitat is considered Valley Oak Woodland and Valley Oak – Oregon Ash Woodland. However, a revegetation plan will be developed to ensure that any trees removed during construction activities will be replaced at appropriate ratios. Construction in potential bat habitat may occur at any time of the year,

but the implementation of the abovementioned avoidance and minimization measures will ensure that negative impacts are minimized. Therefore, the proposed project **is not likely to adversely affect** hoary bat.

Bat Cumulative Impacts

No cumulative impacts are anticipated from the proposed project. Trees that will be removed as a result of construction will be replaced. Hence, compensatory mitigation is not required.

SPECIAL-STATUS REPTILES AND AMPHIBIANS

Four special-status reptiles and amphibians have the potential to occur within the BSA. These include California giant salamander (*Dicamptodon ensatus*), western pond turtle (*Emys marmorata*), foothill yellow-legged frog (*Rana boylii*), and red-bellied newt (*Taricha rivularis)*. A brief discussion on these species is provided below.

- **California giant salamander (*Dicamptodon ensatus*). CDFW Species of Special Concern.** The California giant salamander is endemic to the north-central California Coast Ranges, and occurs in two discrete areas north and south of San Francisco Bay respectively. This species primarily occupies moist coniferous and mixed forests, but is also found along streams in coastal woodland and chaparral areas. Adults are largely terrestrial and fossorial, but similar to other fossorial amphibians, can be active at or near the surface in wet conditions such as high humidity or rain events (Thomson et al. 2016). Discoveries of this species at burrows are restricted to wet, shaded along streams, stream banks, and moist road cuts, and only above ground during fall and winter rain events (Fellers et al 2010, Thomson et al 2016). Observations of this species underground come from work in streams and individuals were always within refugia in proximity to creek or spring features (Feller et al 2010). Breeding occurs in cold, permanent or semi-permanent streams, often in headwater reaches. Larvae typically remain aquatic for over a year before metamorphosing (Thomson et al. 2016). Some larvae never undergo metamorphosis, and become reproductively mature while remaining aquatic. Prey consists of a variety of invertebrates and small vertebrates.
- **Western pond turtle (E*mys marmorata*), CDFW Species of Special Concern.** The western pond turtle (WPT) is the only native freshwater turtle in California. This turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and Transverse Ranges. WPT inhabits annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 feet in elevation. Pond turtles also occupies man-made habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks, and sand. Warm, shallow, nutrient-rich waters are ideal as they support prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. Turtles require suitable aquatic habitat for most of the year; however, WPT often occupies creeks, rivers, and coastal lagoons that become seasonally unsuitable. To escape periods of high water flow, high salinity, or prolonged dry conditions, WPT may move upstream and/or take refuge in vegetated, upland habitat for up to four months (Rathbun et al. 2002). Although upland habitat is utilized for refuging and nesting,

this species preferentially utilizes aquatic and riparian corridors for movement and dispersal.

WPT nests from late April through July. This species requires open, dry upland habitat with friable soils for nesting and prefer to nest on unshaded slopes within 15 to 330 feet of suitable aquatic habitat (Rathbun et al. 1992). Females venture from water for several hours in the late afternoon or evening during the nesting season to excavate a nest, lay eggs, and bury the eggs to incubate and protect them. Nests are well-concealed, though native mammals are occasionally able to locate and predate upon eggs. Hatchlings generally emerge in late fall but may overwinter in the nest and emerge in early spring of the following year.

- **Foothill yellow-legged frog (*Rana boylii*). State Candidate, CDFW Species of Special Concern.** The foothill yellow-legged frog historically occurred in coastal and mountain streams from southern Oregon to Los Angeles County, but has declined in many parts of this range. This species is strongly associated with rivers and creeks, and prefers shallow, flowing water with a rocky substrate. Individuals do not typically move overland and are rarely observed far from a source of permanent water. In northern California, it was observed adults were on average within ten feet and rarely over 40 feet from the stream (Bourque 2008). Although upland habitat usage is not well studied, the data suggest that movements away from water are related to flood events (Kupferberg 1996, Bourque 2008, Thomson et al. 2016). Frogs in intermittent drainages may move more than those in perennial but movements are within the creek corridors (Kupferberg 1996, Bourque 2008, Gonsolin 2010). There were opportunistic observations that coastal yellow-legged frogs may use upland habitats in winter (Nussbaum et al. 1983, Welsh, H. per. comm. as reported in Bourque 2008); however, this has not been supported by data and these movements away from water into terrestrial habitat are likely in response to high flows and flood events (Kupferberg 1996, Bourque 2008). Aquatic breeding sites are often near stream confluences, with egg masses typically deposited behind or sometimes under rocks in low-flow areas with cobble and/or gravel (Thomson et al. 2016).

- **Red-bellied newt (*Taricha rivularis*). CDFW Species of Special Concern.** The red-bellied newt is endemic to the California Coast Ranges from southern Sonoma County through central Humboldt County. Cool coastal forests (typically coniferous) provide typical habitat, though this species also occupies hardwood forests. Similar to other newts, adults are primarily terrestrial but shift annually between terrestrial and aquatic (breeding) phases. Breeding occurs during the spring in mountain streams, usually with moderate to high flow and rocky substrates; ponds are only rarely used (Thomson et al. 2016). Although this species often shows fidelity to certain stream reaches, adults are capable of moving a mile over more from year to year (Thomson et al. 2016).

Survey Results

In the BSA, Maacama Creek flows through a wide channel under Chalk Hill Road Bridge. The slope along the northern bank is gradual while that along the southern bank is more abrupt and characterized by a steep rock wall that the bridge abutments are anchored to. As shown in Figure 2, the northern bank is comprised of a mix of Arroyo willow and Himalayan blackberry communities. The creekbed is composed mainly of cobble and

boulder sized substrate. At the time of the September 14, 2021, site visit, only a small pool of stagnant, receding water just below the southern bridge abutment remained in the BSA from previous seasonal flows. On a previous, June 6, 2019 site visit, flowing water was present in the channel through the BSA.

California giant salamander has been documented in Maacama Creek upstream of the BSA (CDFW 2021). No burrows were observed within the creek bed or along the banks during the site visit, but the BSA had been dry for an extended period. It is possible that when normal flow patterns resume and especially during storm events, this species could move through the BSA. Additionally, the vegetated areas along the northern banks of Maacama Creek within the BSA could provide suitable burrowing habitat.

Western pond turtles have been documented throughout the Maacama Creek watershed (CDFW 2021). The BSA offers plentiful basking opportunities on the exposed cobble substrate. Through examination of photographs of the BSA from prior site visits, it is apparent that during typical water years, Maacama Creek does not regularly fill the entire width of the creek bed in standard flow. It appears that the southern edge of the creek supports a deep pool that remains inundated year-round. WPT would be found in the deeper pools that remain flooded and have lower water velocities than the faster moving portions of the creek that are subject to stormwater flow. WPT would be unlikely to nest within the BSA as there are no open, upland areas that are not shaded. No WPT were observed during the September 14, 2021, site visit.

In the BSA, Maacama Creek is typically perennial even during periods of low rainfall. However, the region is experiencing a period of extreme drought and only a small pool of water was observed during the September 14, 2021 site visit. This pool is within the area that would typically support a deeper pool that would connect to flowing creek. In typical water years, foothill yellow-legged frog (FYLF) would be able to breed within the BSA. There are many documented occurrences of the species throughout the Maacama Creek watershed (CDFW 2021). FYLF have the potential to deposit eggs within the cobble substrate of the creek in the faster moving waters and may be present within the streambed throughout the BSA.

No red-bellied newts were observed during the September 14, 2021 site visit, but the species has been documented upstream of the BSA within the Maacama Creek watershed. The species could easily disperse downstream to the BSA when streamflow returns to normal levels. These newts utilize similar breeding habitats as FYLF and could breed within the rocky substrate of Maacama Creek. The high flow velocity of the creek offers ideal conditions for breeding.

Avoidance and Minimization of Potential Impacts

Western Pond Turtle

To prevent negative impacts to WPT during project activities, the following measures are recommended:

- Pre-construction surveys should be performed within 24 hours of initiation of in-water Project activities.
    - If no WPT are observed, no monitoring is required.

- If WPT are observed, the qualified biologist will relocate the individual(s) outside of the work area to suitable habitat and recommend if a biological monitor is required, or other minimization measures implemented, dependent upon work activities. Such measures may include a protective no-work buffer, exclusion fencing, monitoring, or coordination with CDFW if relocation is required.
- If a biological monitor is not present, and a WPT is observed entering the work area, work will stop in the immediate vicinity and the qualified biologist notified to relocate the individual and assess if additional minimization measures should be implemented.

Special-status Amphibians

Special-status amphibians have the potential to breed within the BSA. The following measures are recommended to avoid impacts to these amphibians within the BSA:

- All work within 100 feet of any wetted stream feature or associated riparian area should be conducted outside of the rainy season (October 16 – June 14). No work should occur within 48-hours after a precipitation event. Timing should also occur outside of the FYLF breeding season (March 1 to June 30).
- Within 48-hours prior to start of work, a pre-construction survey should be conducted by a qualified biologist to determine whether the BSA has potential to support special-status amphibians during the time of construction. Surveys should cover at least 500 feet upstream and 500 feet downstream of the work area for presence of all life stages. If any special-status amphibians are observed, the qualified biologist will relocate the individual(s) outside of the work area to suitable habitat and recommend if a biological monitor is required, or other minimization measures implemented, dependent upon work activities.
- If surface water is present during construction, a qualified biologist shall inspect the work area daily prior to the onset of construction activities for special-status amphibians, especially FYLF.
- Crew members that will work on the Project should undergo a Worker Environmental Awareness Program (WEAP) training conducted by a qualified biologist, which will cover basic identification of all special-status amphibians and recommended actions should any be discovered within the work area.

Reptiles and Amphibians Project Impacts

As summarized in Table 2 above, 0.17 acre of temporary impacts and 0.12 acre of permanent impact to special-status reptile and amphibian habitat would occur as a result of project activities. Habitat for these species is considered to include the Perennial Stream, Arroyo Willow Thickets, Himalayan Blackberry Brambles, and Mixed Oak Woodland. Temporary, direct impacts to the Perennial stream would occur during temporary stream diversion and erecting false work to support the new bridge during the construction phase. Permanent impacts to the stream would occur from the installation of permanent scour protection.

FYLF is currently a candidate species for listing under CESA and as such is afforded the protections conveyed by CESA, including protection from “take” without a permit. The

clade that occurs in the BSA has been evaluated as not warranting listing under CESA at this time by the CDFW Staff Review and the California Fish and Wildlife commission has voted to adopt this finding (CDFW 2019). All work within the creek channel is scheduled to occur during the dry season, between June 15 and October 15. Work within the upland areas may occur outside of this window. FYLF can travel through upland areas to find other suitable habitats. However, there are no suitable FYLF habitats within dispersal range of the BSA that are not bisected by significant barriers to dispersal. It is unlikely that FYLF would utilize upland areas in this manner. Therefore, the proposed project **is not likely to adversely affect** FYLF due to the temporary impacts of the stream diversion and grading. As red-bellied newts have similar breeding requirements to FLYF, the project also **is not likely to adversely affect** red-bellied newts.

Western pond turtle could utilize the perennial stream portions of the BSA and bask along the rocky substrate that composes the creek bed and banks. The lack of open, unshaded upland soils would likely prevent WPT from nesting within the BSA. WPT, if they are found within the BSA, may be temporarily impacted by the stream diversion system that will be installed if conditions warrant during both construction seasons. However, the implementation of the abovementioned avoidance and minimization measures for WPT will ensure that negative impacts are minimized. Therefore, the proposed project **is not likely to adversely affect** western pond turtle.

Due to the exceedingly dry conditions at the site presently, it is unlikely that California giant salamanders are currently found within the BSA. However, if a significant storm event occurs they could pass through the Perennial Stream or establish burrows within the Arroyo Willow Thickets. The permanent impacts due to the installation of scour countermeasures within the Perennial stream could be beneficial to California Giant Salamander, as the log rootwads would provide refugia for the species to utilize within the stream. Due to the temporary nature of the impacts in the other communities, and the abovementioned conservation measures for amphibians, the project **is not likely to adversely affect** California giant salamander.

Reptiles and Amphibians Cumulative Impacts

No cumulative impacts are anticipated to occur as a result of proposed project activities. The project plans involve the restoration of all disturbed graded areas and vegetation to pre-project conditions, which will restore amphibian habitat. No barriers to dispersal would be created by the proposed project.

SPECIAL-STATUS FISH SPECIES

Three special-status species have the potential to occur within the BSA. These include Russian River tule perch (*Hysterocarpus traskii pomo*), Chinook salmon – California Coastal ESU (*Oncorhynchus tshawytscha*), Coho salmon - Central California Coast ESU (*Oncorhynchus kisutch*), and steelhead - Central California Coast DPS (*Oncorhynchus mykiss*). A brief discussion of each of these species is included below.

- **Russian River tule perch (*Hysterocarpus traskii pomo*), CDFW Species of Special Concern.** Russian River Tule Perch is a subspecies of Tule Perch (*Hysterocarpus traskii*) which occurs only in the Russian River and its lower tributaries. Tule perch are the only freshwater surfperch and are native to rivers and estuaries of central California. Tule perch are small (up to 15 cm) with a definite hump shape between the head and dorsal fin. Their color varies, with

bluish or purplish cast backs, a whitish or yellowish belly, and a barred pattern on the sides. They inhabit lowland lakes, sloughs, streams, and rivers, generally in areas with beds of vegetation or overhangs. Their diet consists of small invertebrates sucked up from the bottom or in midwater. They generally gather in groups, and as with all surfperches, bear live young.

- **Chinook salmon - California Coastal ESU (*Oncorhynchus tshawytscha*), Federal Threatened, State Threatened.** The California Coastal (CC) Chinook salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). CC Chinook salmon typically return to their natal rivers in the fall after 2 to 3 years at sea. Juveniles emerge in late winter or spring. Smolts utilize flood-rich tidal or flooded habitats with overhanging cover or undercut banks to forage (CalTrout 2021).
- **Coho salmon - Central California Coast ESU (*Oncorhynchus kisutch*), Federal Endangered, State Endangered.** The Central California Coast ESU includes all naturally spawned populations of coho salmon (and their progeny) in California streams from the Eel River to Aptos Creek, including the Russian River and its tributaries, excluding the Sacramento-San Joaquin River Basin. Coho salmon typically migrate in late fall to early winter to spawn in smaller coastal streams. Spawning migration known as "runs" occur throughout the year. Spawning occurs mainly between November and January, but can occur as late as March during drought conditions. Juveniles may spend several years in the freshwater habitat before migrating to the ocean. Most adult fish return "home" maintaining fidelity to their natal stream. Preferred spawning habitat for coho salmon is small freshwater streams with cool to cold water temperature, medium to small gravel substrate, and high dissolved oxygen levels at the head of a riffle where water changes from laminar flow to turbulent flow (providing greater dissolved oxygen). Abundant riffle areas (shallow areas with gravel substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.
- **Steelhead - Central California Coast DPS (*Oncorhynchus mykiss irideus*), Federal Threatened**. The Central California Coast DPS includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin. Steelhead typically migrate to marine waters after spending two years in freshwater, though they may stay up to seven. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4-or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels and fast flowing water. Abundant riffle areas (shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.

Survey Results

No salmonids or other fish species were observed during the September 14, 2021 site visit. However, steelhead presence in Maacama Creek is well documented by CDFW

(CDFG 2006) and critical habitat for steelhead and coho salmon is present in Maacama Creek (NOAA 1999 and NOAA 2005). Additionally, the salmonid monitoring program on the Russian River watershed has documented steelhead in Maacama Creek, and coho within Redwood Creek, which joins Maacama Creek upstream of the BSA (California Sea Grant 2021). Due to the confirmed reports of steelhead in Maacama Creek and the close proximity to Redwood Creek, it is presumed that both species are present. Monitoring by California Sea Grant has also found CC Chinook salmon spawning in Redwood Creek in 2015-2016 and 2016-2017, and an adult Chinook carcass in the mainstem of Maacama Creek downstream of the BSA (California Sea Grant 2021, Sonoma RCD 2015). Consequently, this species is also presumed present within the BSA. Russian River tule perch has also been documented within Maacama Creek and can be presumed present (CDFG 2006).

The BSA contains deep, shaded pools that remain inundated throughout the year during years of normal and above-normal flow, which could offer refugia for special-status fish species mentioned above. The gravel and cobble substrate are of suitable size for all species as well. Temperature was not measured during the site visit, so it is unknown whether the BSA could provide suitable rearing habitat throughout the summer and fall months during the current drought period for these species, however, in wetter years, the BSA may have perennial streamflow and pools of suitable depth and temperature to provide fish species with oversummering habitat.

Avoidance and Minimization of Potential Impacts

The implementation of the stream diversion system that is described in the Project Description will help minimize potential negative direct impacts to special-status fish species within the BSA during construction. In addition to the stream diversion system, the following measures are recommended:

- ESA Section 7 consultation with NMFS will be conducted to ensure the proposed project would not result in permanent adverse effects to steelhead, coho salmon, Chinook salmon or critical habitat, and temporary effects will be avoided and minimized.
- A fish capture and relocation plan will be prepared for the proposed projectThe plan will be submitted for NMFS for approval no less than 30 days prior to construction. The plan would be implemented to move fish and other aquatic life in the project area to a suitable location outside the project area if streamflow and/or pools are present in the BSA during construction, and if work including installation of the stream diversion system would potentially affect aquatic species. At a minimum, the plan will include the following:

    If flow is present, a fish capture and relocation operation will be conducted prior to construction to remove fish and other aquatic species form the work site. Salmonids and other native species encountered will be relocated safely to a location where suitable habitat is present. The stream will be diverted into the temporary channel, and the work area dewatered and isolated from stream flow.

    Fish capture and relocation will be completed if flowing water or pools with potential to support fish remain in the proposed project area at the time work in the creek bed occurs, and work activities will be implemented by a qualified biologist during dewatering activities in Maacama Creek. The

fish capture and relocation plan will include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish capture and relocation during dewatering activities.

If dewatering is necessary, pumps with 0.1-inch mesh will be used to remove standing water from the work area within the cofferdams to a filtration basin to prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or be released through filter bags will prevent excessive turbidity or sediment loads during the dewatering process.

- Work within the channel would be conducted during the dry season (June 15 through October 15) to avoid disrupting the adult migration cycle. In-channel work outside of this period would require further written approval from NMFS.
- Concrete, dust, and other debris from concrete removal activities will be captured and removed from the work site so as not to enter the creek channel.
- The creek banks would be restored to pre-project conditions, or better, following the completion of work.
- The creek channel would be restored to the original grade using native cobble, gravel, and soils in appropriate ratios to mimic pre-project conditions.

Project Impacts

As summarized in Table 2, 0.11 acre of temporary impacts and 0.06 acre of permanent impacts to steelhead and coho salmon and their critical habitat, Chinook salmon habitat, and Russian River tule perch habitat would occur from the project. Temporary, direct impacts to the Perennial stream would occur during temporary stream diversion, grading, fish capture and relocation (if needed), and erecting false work to support the new bridge during the construction phase. Permanent impacts to the stream would occur from the installation of permanent scour protection and shading of riparian vegetation from the new bridge. Arroyo Willow Thickets would be temporarily impacted by the construction of the access ramps and temporary excavation support. Arroyo Willow Thickets and Valley Oak Woodland under the new bridge footprint would be permanently impacted due to shading.

Proposed project construction would result in temporary and permanent impacts to designated critical habitat for steelhead and coho salmon, and habitat for Chinook salmon and Russian River tule perch; however, no permanent adverse impacts are anticipated. All construction within the creekbed is scheduled when special-status fish species are least likely to be present or passing through the BSA. Implementation of the fish capture and relocation plan, if needed, would ensure fish are not harmed by stream dewatering, and implementation of the stream diversion system described in the project description would allow any fish moving through the stream to safely pass through the BSA during construction. Construction of the new bridge would involve work within the creek, but the materials added to the creek bed would be removed upon completion of the new bridge. The stream channel and banks would be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists. South creek

bank stabilization is demonstrated in Appendix B (S36 to S38). Restoration would use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient.

Permanent impacts to critical habitat would result from the implementation of the scour countermeasures. The countermeasures include the installation of vegetated rock slope protection and log rootwads along the southern banks of Maacama Creek that has been severely eroded from high flows in recent years. The installation of slope protection would limit riparian growth in the short-term, and to some extent over the long-term. However, willow stakes and other native riparian vegetation will be interspersed with the rock material, and these plantings are expected to improve riparian cover as they mature. In addition, the log rootwads are designed to provide flow refugia for migrating and rearing salmonids and complex rearing habitat that juveniles utilize for cover. In more typical water years, log rootwads create scour pools that can persist into the dry months, providing additional habitat for oversummering juveniles. These habitat benefits will enhance the value of salmonid habitat in the BSA.

Permanent impacts to salmonid habitat would also result from shading of riparian vegetation from construction of the new bridge. However, with demolition and removal of the existing bridge, establishment and growth of new riparian vegetation is expected, offsetting the impacts. A net total of approximately 122 linear feet of riparian vegetation may be lost due to the project's shading impacts.

If Maacama Creek has perennial flow at the time of construction, the proposed project would result in a temporary loss of habitat for all of the special-status fish species discussed above and would result in a permanent alteration to critical habitat for CCC steelhead and CCC coho salmon. If suitable rearing habitat in the form of streamflow in the channel or pools with suitable conditions are present at the time of construction, a fish capture and relocation plan may need to be implemented prior to stream diversion according to the stream diversion plan. CCC steelhead and CCC coho salmon juveniles may be present in the project area and would be relocated to nearby suitable habitat prior to stream diversion. CC Chinook are not expected to be present at the project site during the construction period. Therefore, the proposed project **may affect, likely to adversely affect** CCC steelhead, CCC coho salmon and both of their critical habitats; the proposed project **may affect, not likely to adversely affect** CC Chinook salmon. With the avoidance and minimization measures included to protect special-status fish species, the proposed project **is not likely to adversely affect** Russian River tule perch.

Cumulative Impacts

No cumulative effects are anticipated from the proposed project. The proposed project would restore the BSA to near pre-project conditions and allow continued fish passage. Restoration to near pre-project conditions would ensure that no barriers are created to fish passage during proposed project activities, and any improvements to downstream fish passage would not be hindered by the proposed project.

SPECIAL-STATUS AND NON-SPECIAL-STATUS NESTING BIRDS

Although no special-status bird species are likely to occur within the BSA, most native birds in the United States, including non-status species, are protected by the Migratory

Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, or young is illegal.

Nesting Birds Survey Results

Vegetation within and surrounding the BSA may provide potential nest sites or foraging habitat for bird species covered under the Migratory Bird Treaty Act of 1918 and protected by California Fish and Game Code. During the site visit, swallow nests were observed on the bridge structure. Other birds could utilize the trees throughout the BSA as well as the emergent vegetation within the creek for nesting.

Nesting Birds Avoidance and Minimization of Impacts

A total of 33 trees are anticipated to be removed during construction activities. This will result in a loss of nesting bird habitat. The following measures will be implemented to avoid and minimize potential impacts to special-status and non-special-status nesting bird species:

- If proposed project activities begin between February 1 and August 31, pre-construction surveys will be conducted by a qualified biologist prior to vegetation removal and to determine whether active nests containing eggs, chicks, or young are present in the BSA. Pre-construction surveys for active nests will be conducted no more than 14 days prior to ground disturbing activities.
- If active nests containing eggs, chicks, or young are not observed during pre-construction surveys, construction can proceed.
- If active nests containing eggs, chicks, or young are observed, ground-disturbing activities will be avoided within a 25- to 100-foot exclusion zone for passerine birds and a 200- to 500-foot exclusion zone for raptors and special-status species. Exclusion size will be dependent upon species and nest location. Appropriate exclusion distances will be determined by a qualified biologist based on the species present and location of the nest relative to construction activities (e.g., the nest is sufficiently shielded from construction to avoid disturbance). Construction within this buffer will be prohibited until the qualified biologist determines that the nest is no longer active. If an active nest is found after the completion of the pre-construction surveys or after construction begins, all construction activities will stop until a qualified biologist has evaluated the nest and determined an appropriate buffer to be placed around the nest. If avoidance of a buffer zone is not feasible, CDFW will be contacted to coordinate an appropriate course of action.
- If proposed project activities begin during the non-nesting season (September 1 through January 31), no pre-construction nesting bird surveys will be required.

Nesting Birds Project Impacts

The BSA contains potential nesting habitat for special-status and non-special-status nesting birds. Construction activities could result in direct impacts to active nests, loss of nesting habitat, and construction noise could result in temporary indirect impacts to active nests. The 33 trees that will be removed will constitute a permanent loss of nesting habitat. Additional trees may be trimmed to allow for construction of an access ramp to the

creekbed. Based on the number of trees in the adjacent habitat, the removal of trees would not constitute a significant impact.

The proposed project will not result in any changes to existing land use and the BSA will be restored to pre-project conditions, therefore no indirect effects are expected.

Nesting Birds Cumulative Impacts

No future public or private activities are known to be planned and or reasonably foreseen for the BSA. Therefore, cumulative effects on special-status and non-special-status nesting birds are not anticipated for the proposed project.

Chapter 5 – Conclusions and Regulatory Determinations

Federal Endangered Species Act Consultation Summary

There has been no federal Endangered Species Act Section 7 consultation to date with the USFWS and/or NMFS. Section 7 Consultation with USFWS is not required. Maacama Creek is designated as critical habitat for CCC steelhead and CCC coho salmon, and both species are considered present in the BSA. CC Chinook salmon are also considered present in the BSA. Work is proposed to occur below top of bank within the creek, which may affect listed salmonids, requiring consultation with NMFS. This coordination will occur following the NEPA process.

The proposed project may affect, likely to adversely affect CCC steelhead (Federal Threatened), CCC coho salmon (Federal endangered), and designated critical habitat for both species. The proposed project may affect, not likely to adversely affect CC Chinook salmon (Federal threatened). Therefore, formal consultation is required from NMFS to assess impacts of the proposed project as well as avoidance and minimization measures used to avoid and limit impacts. This may include establishment of work windows, a review of the proposed project design by NMFS for fish passage consideration, and submittal of a plan for capture and relocation of salmonids out of the construction area if fish may be present. A Biological Assessment and a request for a biological opinion will be submitted to NMFS as part of the consultation process.

Essential Fish Habitat Consultation Summary

As discussed in the previous section, coho salmon are part of Pacific Salmon EFH in California. Based on the fact that the proposed project will temporarily impact the creek bed and will alter the channel, the project may adversely affect EFH. EFH Consultation with NMFS is required. The consultation process has not yet been initiated and will be conducted with NMFS as part of the Section 7 consultation.

California Endangered Species Act Consultation Summary

Foothill yellow-legged frog, a candidate for state listing, has the potential to occur and breed within the BSA, and could be affected by the stream diversion system that will be installed if conditions warrant in Year 1 and Year 2 of construction. With the avoidance and minimization measures for amphibians included with the proposed project, and the short-term, temporary impacts of the stream diversion (if it is needed), FYLF are not anticipated to be adversely affected. FYLF can also travel through upland areas to find other suitable habitats. However, there are no suitable FYLF habitats within dispersal range of the BSA that are not bisected by significant barriers to dispersal. It is unlikely that FYLF would utilize upland areas in this manner. Therefore, the proposed project **is not likely to adversely affect** FYLF.

Wetlands and Other Waters Coordination Summary

A formal wetland delineation has been conducted within the BSA. The formal delineation was performed as stipulated by the requirements of the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (“Corps Manual”; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West*

Region (Version 2.0) ("Arid West Supplement"; USACE 2008). The results of this delineation will be used to determine which regulatory agencies have jurisdiction over the wetlands and waters found throughout the BSA. The appropriate permits will then be acquired prior to construction. The delineation is included in Appendix G.

Invasive Species

With implementation of the avoidance and minimization efforts in Section 3, the proposed project would not result in severe infestations of invasive plant species.

Other

Migratory Bird Treaty Act. Although potential nesting habitat for breeding birds would not be lost as a result of the proposed project, construction could result in temporary impacts if active nests are disturbed. Measures including preconstruction surveys and establishment of buffers if active nests are found will ensure that the proposed project would not affect nesting birds.

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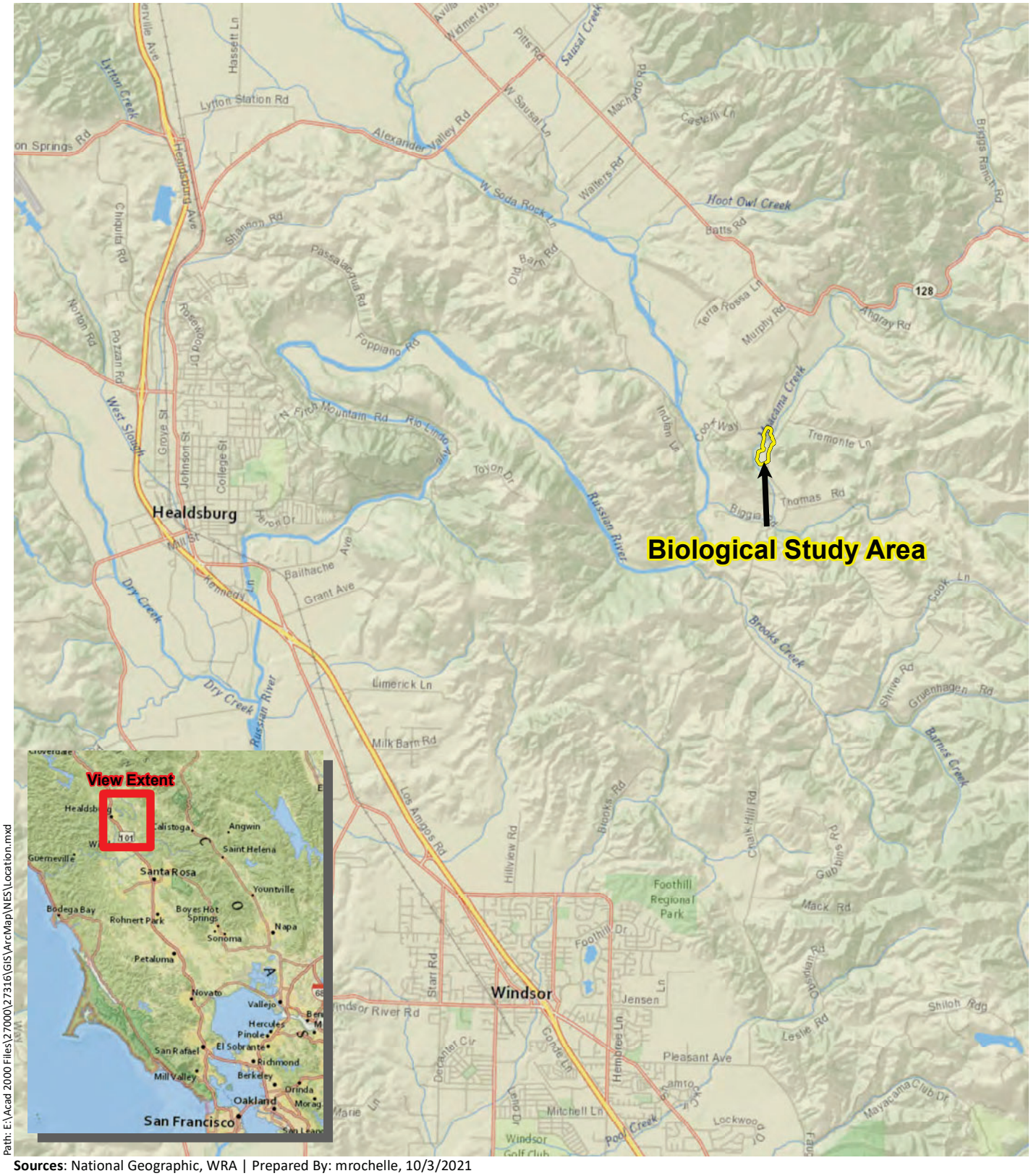
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Appendix A – Project Figures



Path: E:\Acad 2000 Files\27000\27316\GIS\ArcMap\NES\Location.mxd

Sources: National Geographic, WRA | Prepared By: mrochelle, 10/3/2021

Figure 1: Biological Study Area Location Map

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

ENVIRONMENTAL CONSULTANTS

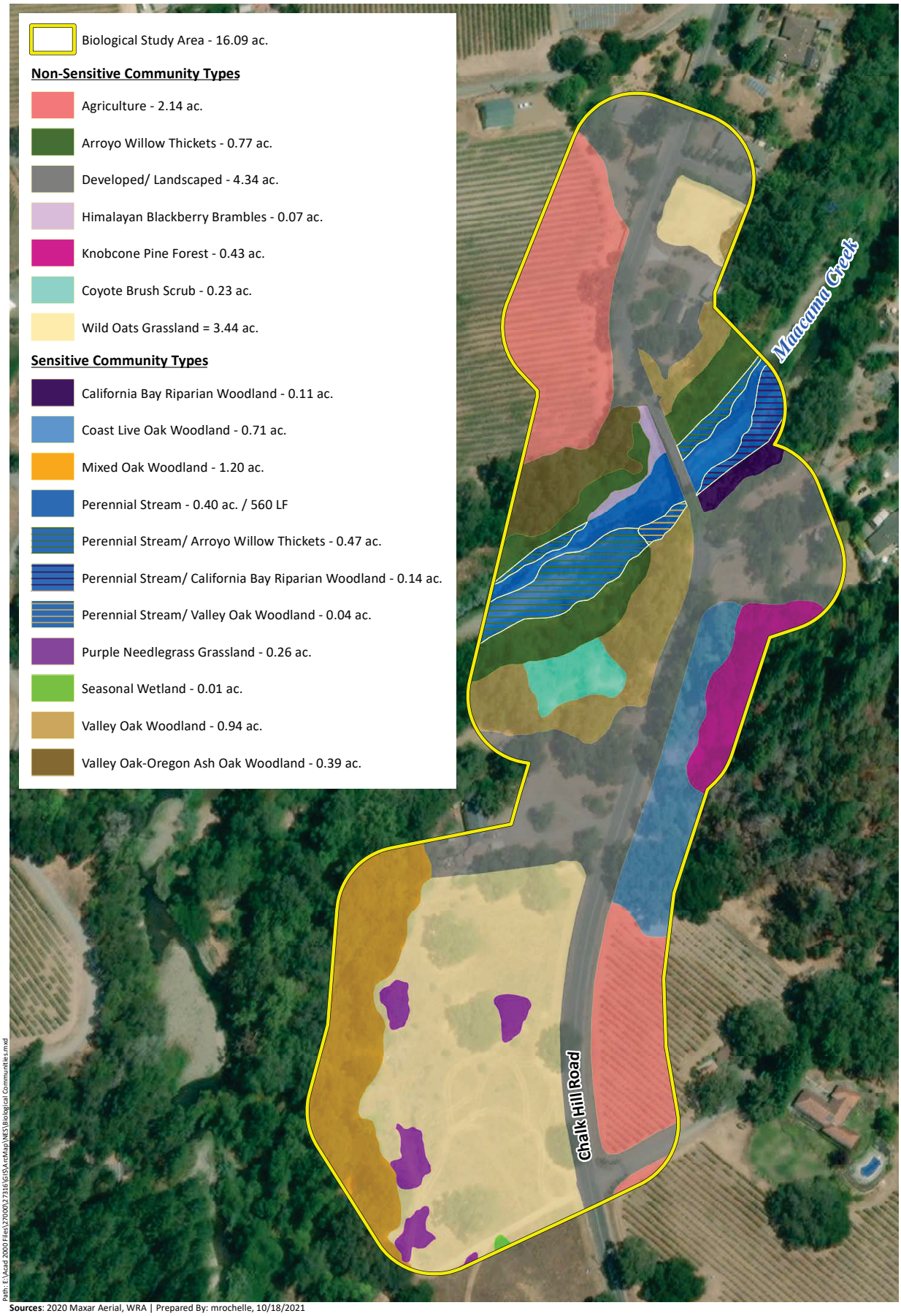


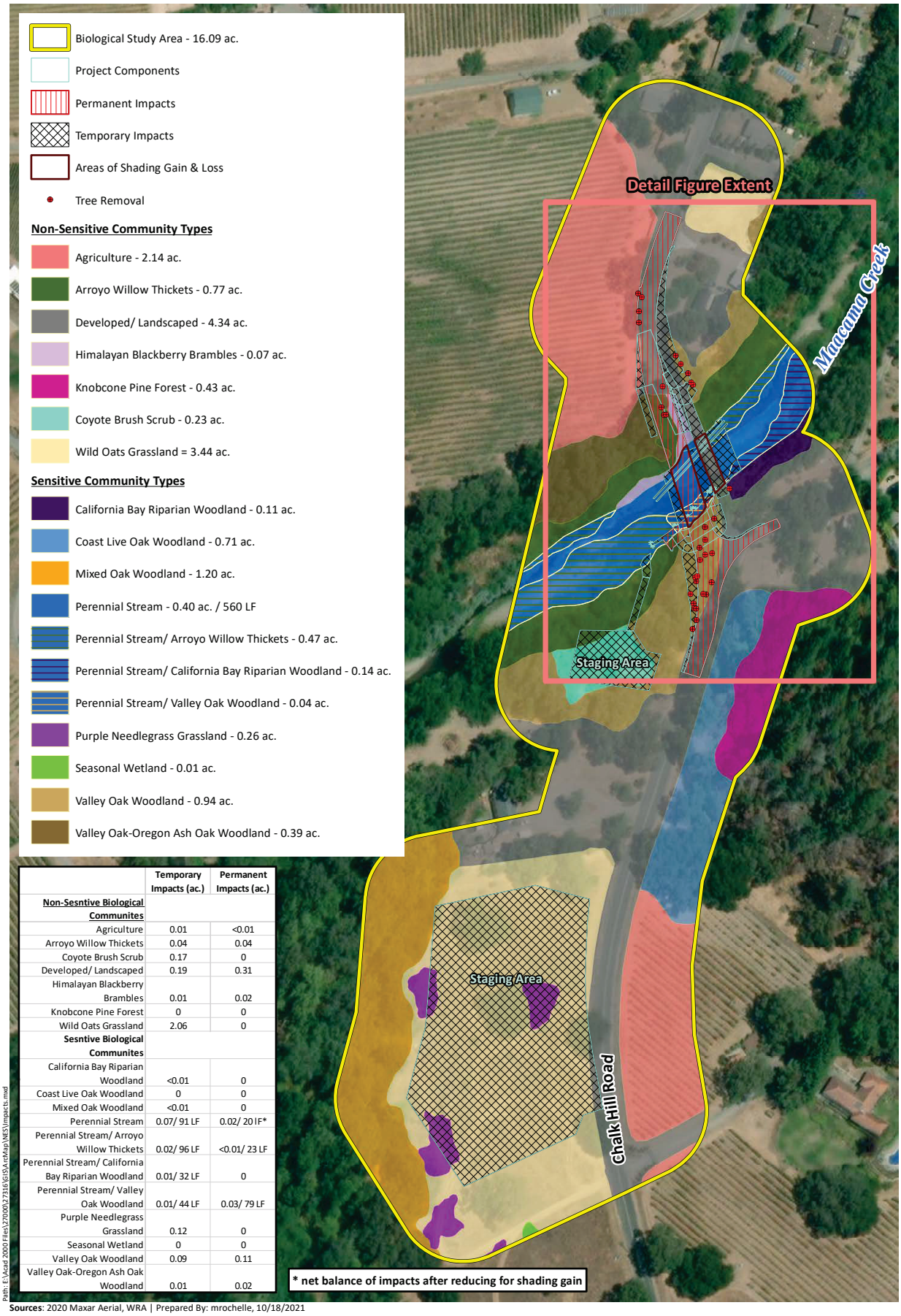
Figure 2. Biological Communities within the Biological Study Area

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

0 200 400 Feet

N

wra ENVIRONMENTAL CONSULTANTS



	Temporary Impacts (ac.)	Permanent Impacts (ac.)
Non-Sesntive Biological Communites		
Agriculture	0.01	<0.01
Arroyo Willow Thickets	0.04	0.04
Coyote Brush Scrub	0.17	0
Developed/ Landscaped	0.19	0.31
Himalayan Blackberry Brambles	0.01	0.02
Knobcone Pine Forest	0	0
Wild Oats Grassland	2.06	0
Sesntive Biological Communites		
California Bay Riparian Woodland	<0.01	0
Coast Live Oak Woodland	0	0
Mixed Oak Woodland	<0.01	0
Perennial Stream	0.07/ 91 LF	0.02/ 20 IF*
Perennial Stream/ Arroyo Willow Thickets	0.02/ 96 LF	<0.01/ 23 LF
Perennial Stream/ California Bay Riparian Woodland	0.01/ 32 LF	0
Perennial Stream/ Valley Oak Woodland	0.01/ 44 LF	0.03/ 79 LF
Purple Needlegrass Grassland	0.12	0
Seasonal Wetland	0	0
Valley Oak Woodland	0.09	0.11
Valley Oak-Oregon Ash Oak Woodland	0.01	0.02

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Sources: 2020 Maxar Aerial, WRA | Prepared By: mrochelle, 10/18/2021

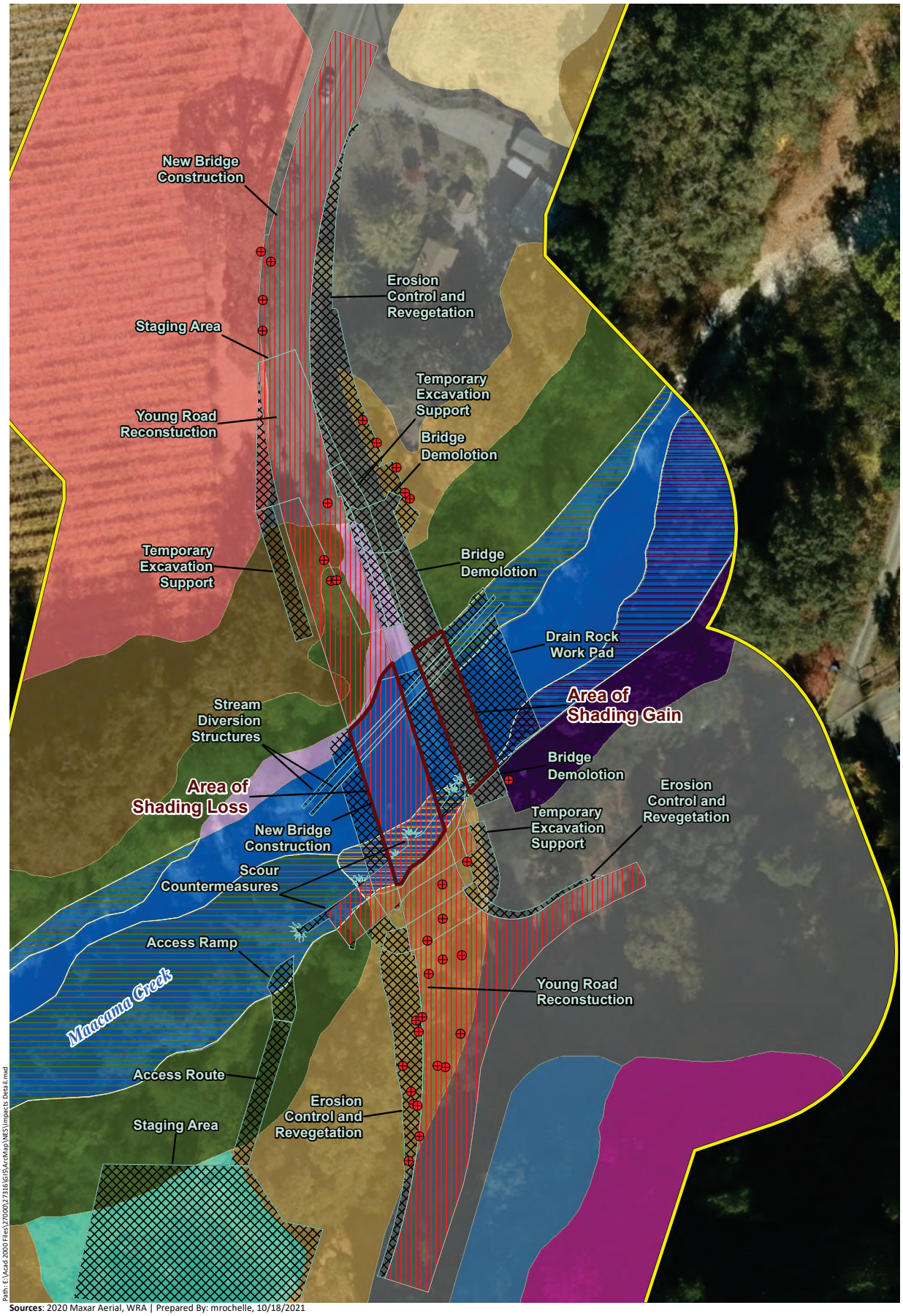
Figure 3A. Biological Communities Impacted within the Biological Study Area (Overview)

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

0 200 400 Feet

N

wra ENVIRONMENTAL CONSULTANTS



Sources: 2020 Maxar Aerial, WRA | Prepared By: mrochelle, 10/18/2021

Figure 3B. Biological Communities Impacted within the Biological Study Area (Detail)

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

0 50 100 Feet

N

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Appendix B – 35% Project Plans

INDEX OF PLAN SHEETS

SHEET NO.	SHEET NAME	SHEET TITLE
1	T01	TITLE SHEET
2	G02	ABBREVIATIONS, LEGEND AND GENERAL NOTES
3	C01	TYPICAL SECTIONS
4	C02	PLAN AND PROFILE – CHALK HILL ROAD
5	C03	PLAN AND PROFILE – YOUNG ROAD
6	C04	CROSS SECTIONS 1
7	C05	CROSS SECTIONS 2
8	C06	CROSS SECTIONS 3
9	C07	CROSS SECTIONS 4
10	C08	CROSS SECTIONS 5
11	C09	CROSS SECTIONS 6
12	C10	CROSS SECTIONS 7
13	C11	EROSION CONTROL PLAN
14	C12	TREE REMOVAL PLAN
15	S01	GENERAL NOTES (BRIDGE)
16	S02	STRUCTURE PLAN
17	S03	DECK CONTOUR PLAN
18	S04	FOUNDATION PLAN 1
19	S05	FOUNDATION PLAN 2
20	S06	ABUTMENT 1 GEOMETRY 1
21	S07	ABUTMENT 1 GEOMETRY 2
22	S08	ABUTMENT 1 REINFORCING 1
23	S09	ABUTMENT 1 REINFORCING 2
24	S10	ABUTMENT 2 GEOMETRY 1
25	S11	ABUTMENT 2 GEOMETRY 2
26	S12	ABUTMENT 2 REINFORCING 1
27	S13	ABUTMENT 2 REINFORCING 2
28	S14	RETAINING WALL SECTIONS
29	S15	(NOT USED)
30	S16	PILE DETAILS
31	S17	BOX GIRDER TYPICAL SECTION
32	S18	GIRDER LAYOUT
33	S19	PT ANCHORAGE AT ABUTMENTS
34	S20	(NOT USED)
35	S21	DIAPHRAGM AT ABUTMENT 1
36	S22	DIAPHRAGM AT ABUTMENT 2
37	S23	DECK REINFORCING
38	S24	SOFFIT REINFORCING
39	S25	BEARING LAYOUTS AND DETAILS
40	S26	DECK DRAINS
41	S27	DECK JOINT DETAILS
42	S28	CONCRETE BARRIER LAYOUT – 1
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44	S30	CONCRETE BARRIER TYPE 85 – 1
45	S31	CONCRETE BARRIER TYPE 85 – 2
46	S32	CONCRETE BARRIER TYPE 85 – 3
47	S33	(NOT USED)
48	S34	CONSTRUCTION SEQUENCE
49	S35	EXISTING BRIDGE DEMOLITION SEQUENCE
50	S36	SOUTH CREEKBANK STABILIZATION 1 OF 3
51	S37	SOUTH CREEKBANK STABILIZATION 2 OF 3
52	S38	SOUTH CREEKBANK STABILIZATION 3 OF 3

COUNTY OF SONOMA

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

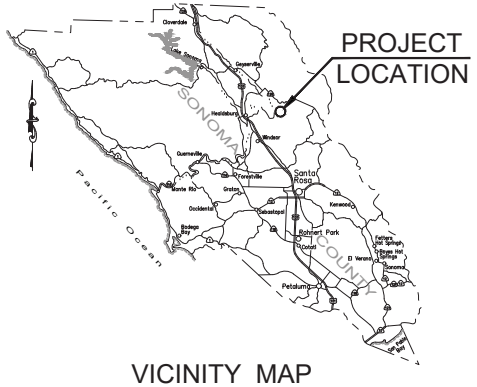
PROJECT PLANS FOR CONSTRUCTION OF CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

(COUNTY ROAD NO. 8806)

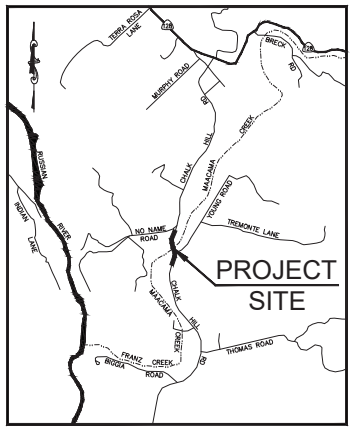
FROM
PLEASANT AVE./FAUGHT ROAD 6.78 MILES TO THE SOUTH
TO
STATE ROUTE 128 1.25 MILES TO THE NORTH

P.M. 16.72 TO P.M. 16.77
NET LENGTH 0.06 MILES

FEDERAL AID PROJECT NO. BRLO–5920(118)



VICINITY MAP
N.T.S



LOCATION MAP
N.T.S.

APPROVED FOR CONSTRUCTION BY:

JOHANNES J. HOEVERTSZ, P.E. DIRECTOR ***DATE***
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

VERTICAL DATUM:

THE ORTHOMETRIC ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OR 1988 (NAVD 1988) AND WERE DETERMINED BY STATIC GPS TIES TO CGPS STATIONS 182, 188 AND 195 WITH PUBLISHED ELLIPSOIDAL HEIGHTS OF 182=1303.480', 188=686.904' AND 195=483.365', IN ADDITION TO APPLYING THE NGS GEOID HEIGHT MODEL GEOID 12A.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, ZONE II, NAD 83, EPOCH 2011.00 AS DETERMINED LOCALLY BY A LINE BETWEEN CONTINUOUS GLOBAL POSITIONING SYSTEMS (CGPS) STATION 182 AND STATION 188; BEING NORTH 11°36'59" WEST AS DERIVED FROM GEODETIC VALUES PUBLISHED BY THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC).

NOTES:

1. ***THE CONTRACTOR SHALL POSSESS CLASS A LICENSE AND A HAZARDOUS SUBSTANCE REMOVAL CERTIFICATION AT THE TIME OF AWARD.***
2. ***THE STANDARD PLANS LIST FOR THIS PROJECT IS INCLUDED IN THE SPECIAL PROVISIONS BOOK.***

T01

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROULLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
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OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

TITLE SHEET

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	1
TOTAL SHEETS	52

FILENAME: CH–T01.DWG 6/3/2021 3:55 PM

ABBREVIATIONS:

AB	AGGREGATE BASE	OG	ORIGINAL GROUND
AC	ASPHALT CONCRETE	OH	OVERHEAD UTILITY
ACP	ASBESTOS CEMENT PIPE	PB	PULL BOX
A.P.N.	ASSESSORS PARCEL NUMBER	PC	POINT OF CURVATURE
		PCC	POINT OF COMPOUND CURVE
A.R.V.	AIR RELEASE VALVE		
BC	BEGIN CURVE	PED	PEDESTRIAN
BFP	BACK FLOW PREVENTER	PI	POINT OF INTERSECTION
BO	BLOWOFF	PRC	POINT OF REVERSE CURVE
BRC	BEGIN REVERSE CURVE	PT	POINT OF TANGENCY
BSW	BACK OF SIDEWALK	PVC	POLY VINYL CHLORIDE
BWV	BACKWATER VALVE	PVI	POINT OF VERTICAL INTERSECTION
BVC	BEGIN VERTICAL CURVE		
CB	CATCH BASIN	PRV	PRESSURE REDUCING VALVE
C&G	CURB & GUTTER		
CI	CAST IRON	R	RADIUS
CIPP	CAST-IN-PLACE PIPE	RET	RETAINING
CL	CLASS	R.C.	RELATIVE COMPACTION
℄	CENTERLINE	RCP	REINFORCED CONCRETE PIPE
CLC	CONTROL LINE COORDINATE		
CMP	CORRUGATED METAL PIPE	RPB	REDUCED PRESSURE BACKFLOW PREVENTER
CP	CONTROL POINT		
CO	CLEANOUT	R&R	REMOVE & REPLACE
CONC	CONCRETE	RT.	RIGHT
CR	CURB RETURN	RW	RECLAIMED WATER
CSP	CORRUGATED STEEL PIPE	R/W	RIGHT-OF-WAY
CV	CHECK VALVE	S	SLOPE
DET.	DETECTOR	SD	STORM DRAIN
DI	DROP INLET	SDCI	STORM DRAIN CATCH BASIN
DIP	DUCTILE IRON PIPE		
DWY	DRIVEWAY	SDE	STORM DRAIN EASEMENT
EC	END CURVE	SDMH	STORM DRAIN MANHOLE
EFC	EAST FACE OF CURB	SL	STREET LIGHT
EG	EXISTING GRADE	SS	SANITARY SEWER
ELEC, E	ELECTRIC	SSE	SANITARY SEWER EASEMENT
EL, ELEV	ELEVATIONS		
EP	EDGE OF PAVEMENT	SS LAT	SANITARY SEWER LATERAL
ER	END CURB RETURN	SSMH	SANITARY SEWER MANHOLE
ESMT	EASEMENT	SSCO	SANITARY SEWER CLEANOUT
EVC	END VERTICAL CURVE		
EX.(E)	EXISTING	STA	STATION
FBG	FEET BELOW GRADE	STD	STANDARD
FC	FACE OF CURB	STL	STEEL PIPE
FF	FINISH FLOOR	TB	TOP OF BANK
FG	FINISHED GRADE	TC	TOP OF CURB
FH	FIRE HYDRANT	TCE	TEMPORARY CONSTRUCTION EASEMENT
℄	FLOW LINE		
FLG	FLOW LINE OF GUTTER	TEL	TELEPHONE
FS	FINISH SURFACE	TG	TOP OF GRATE
FSW	FRONT OF SIDEWALK	TOE	TOE OF SLOPE
FX	FENCE	TOP	TOP OF PIPE
G	GAS	TP	TELEPHONE POLE
GB	GRADE BREAK	TS	TRAFFIC SIGNAL
G SER	GAS SERVICE	TW	TOP OF WALL
GV	GATE VALVE	TYP.	TYPICAL
HDPE	HIGH DENSITY POLYETHYLENE	UG	UNDERGROUND
		UPC	UNIFORM PLUMBING CODE
HP	HIGH POINT	UTIL	UTILITY
IC	INTERCONNECT	VC	VERTICAL CURVE
IG	INVERT GRADE	VIF	VERIFY IN FIELD
INV	INVERT GRADE	VLT	VAULT
IP	IRON PIPE	VAR.	VARIES
JP	JOINT POLE	WM	WATER METER
JT	JOINT TRENCH	WME	WATER MAIN EASEMENT
LF	LINEAR FEET	WS	WATER SERVICE
LG	LIP OF GUTTER	W SER	WATER SERVICE
LT.	LEFT	WTR, W	WATER
MB	MAIL BOX	WV	WATER VALVE
OD	OUTSIDE DIMENSION	< PT	ANGLE POINT

LEGEND

DESCRIPTION OF LINETYPE	PROPOSED	EXISTING
PROPERTY LINE	N/A	
FLOWLINE		
CENTERLINE/CONTROL LINE		
WIRE FENCE	N/A	
STORM DRAIN PIPE		
GAS LINE	N/A	G G
TELEPHONE LINE/CONDUIT	N/A	T T
ELECTRICAL LINE/CONDUIT	N/A	E E
OVERHEAD UTILITY	N/A	OH OH
TEMPORARY CONSTRUCTION EASEMENT	N/A	

DESCRIPTION OF SYMBOL	PROPOSED	EXISTING
ASPHALT CONCRETE		
ROCK SLOPE PROTECTION		N/A
STORM DRAIN DROP INLET		N/A
TREE AND DRIP LINE	N/A	
SURVEY CONTROL POINT	N/A	
JOINT UTILITY POLE	N/A	JP
AGGREGATE BASE		N/A

BENCHMARK

CINQUINI & PASSARINO CONTROL POINT NO. 1 BEING A SET MAG NAIL AND WASHER STAMPED "CINQUINI & PASSARINO CONTROL" ALONG CHALK HILL ROAD AS SHOWN HEREON.
ELEVATION = 175.29' (NAVD 88)

THE ORTHOMETRIC ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988) AND WERE DETERMINED BY STATIC GPS TIES TO CGPS STATIONS P195, P201 & P204 WITH PUBLISHED ELLIPSOIDAL HEIGHTS OF 483.293', 1147.750' AND 909.26', IN ADDITION TO APPLYING THE NGS GEOID HEIGHT MODEL "GEOID2012B".

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, ZONE II, NAD 83, EPOCH 2017.50 AS DETERMINED LOCALLY BY A LINE BETWEEN CONTINUOUS GLOBAL POSITIONING SYSTEMS (CGPS) STATION P204 AND STATION 201; BEING NORTH 20°58'45" WEST AS DERIVED FROM GEODETIC VALUES PUBLISHED BY THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC).

LOCAL BASIS OF BEARINGS

BEING NORTH 14°05'33" EAST FROM CINQUINI & PASSARINO POINT NO. 1 TO CINQUINI & PASSARINO CONTROL POINT NO. 2.

SURVEYOR'S STATEMENT

THIS MAP REPRESENTS A FIELD SURVEY MADE BY CINQUINI & PASSARINO ON NOVEMBER 8, 2018 AND REPRESENTS THE VISUAL SURFACE CONDITIONS AS OF AFORESAID DATE.

CONSTRUCTION NOTE DESIGNATIONS

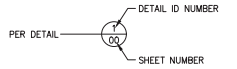
(D1) = DRAINAGE AND RELATED ITEMS CONSTRUCTION NOTES.

(EC) = EROSION CONTROL AND RELATED ITEMS CONSTRUCTION NOTES.

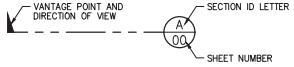
(R1) = ROADWAY AND RELATED ITEMS CONSTRUCTION NOTES.

DETAIL AND SECTION CALLOUTS

DETAILS:



SECTIONS:



PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

DWG. G2

DESIGN BY	WJK	ABBREVIATIONS, LEGEND & GENERAL NOTES	
DRAWING BY	WJK	CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT PROJECT	
CHECKED BY	HEU		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_SECOND.DWG 6/3/2021

REGISTERED PROFESSIONAL ENGINEER — HEIDI E. UTTERBACK — No. 53723 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

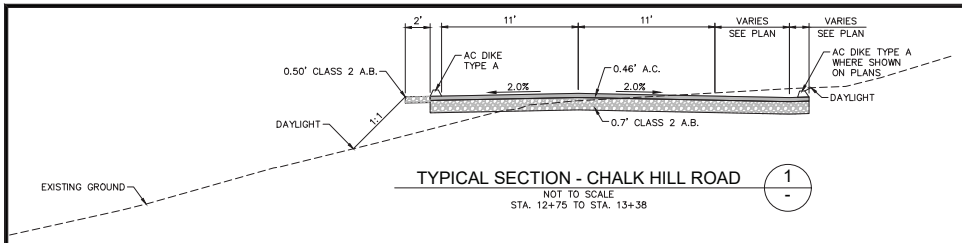
DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

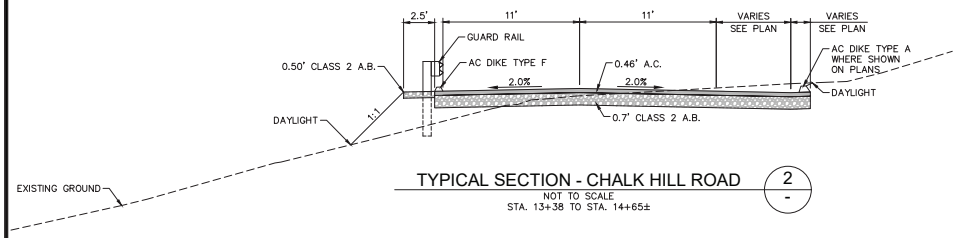
ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	2
TOTAL SHEETS	52

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Images: DTPW-logo-10X10.tif
Path: F:\Civil 3D Projects\013962 Chalk Hill Bridge\DWG\013962_SECOND.dwg Layout Name: SH-2 Plot Date: Jun 04, 2021 at 09:29 am



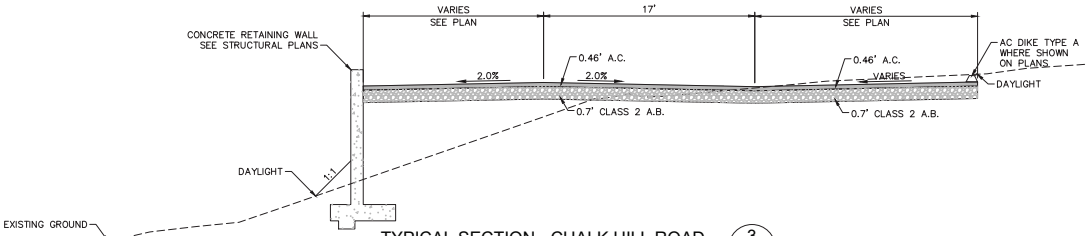
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NOT TO SCALE
STA. 12+75 TO STA. 13+38



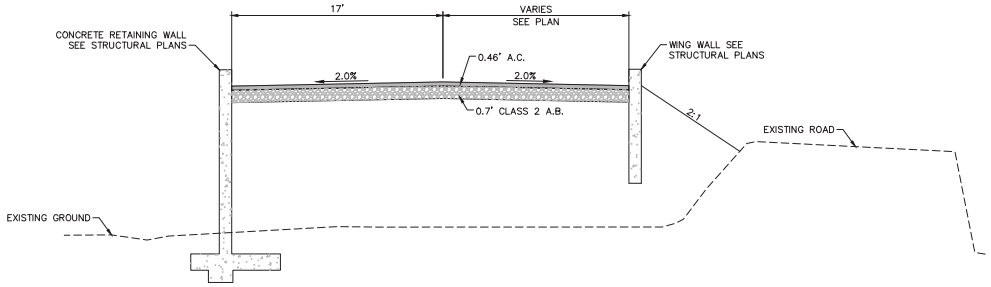
TYPICAL SECTION - CHALK HILL ROAD 2

NOT TO SCALE
STA. 13+38 TO STA. 14+65±



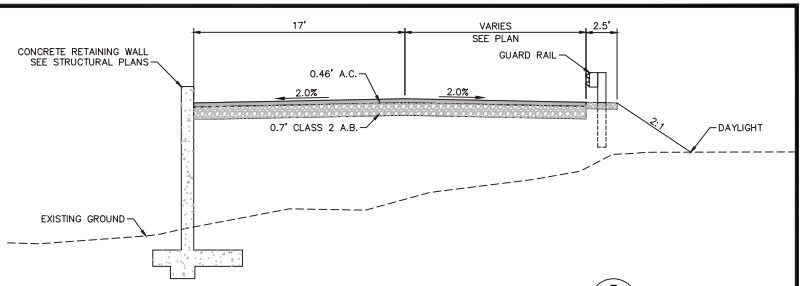
TYPICAL SECTION - CHALK HILL ROAD 3

NOT TO SCALE
STA. 14+65± TO STA. 14+87.3



TYPICAL SECTION - CHALK HILL ROAD 4

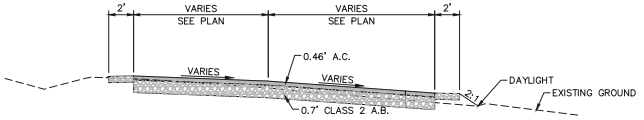
NOT TO SCALE
STA. 16+93.23 TO STA. 17+12.93



TYPICAL SECTION - CHALK HILL ROAD 5

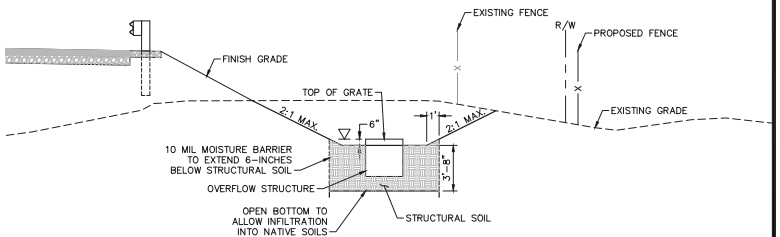
NOT TO SCALE
STA. 17+12.93 TO STA. 18+63.10

NOTE:
R VALUE = 45
TRAFFIC INDEX = 9
ADT = 1100
DESIGN SPEED = 30 mph



TYPICAL SECTION - CHALK HILL ROAD 6

NOT TO SCALE
STA. 18+63.10 TO STA. 19+79.43



BIORETENTION SECTION 7

NOT TO SCALE

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

DWG. C-1

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_SECOND.DWG 6/3/2021

REGISTERED PROFESSIONAL ENGINEER — HEIDI E. UTTERBACK — No. 53723 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION COMPLETED:
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RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

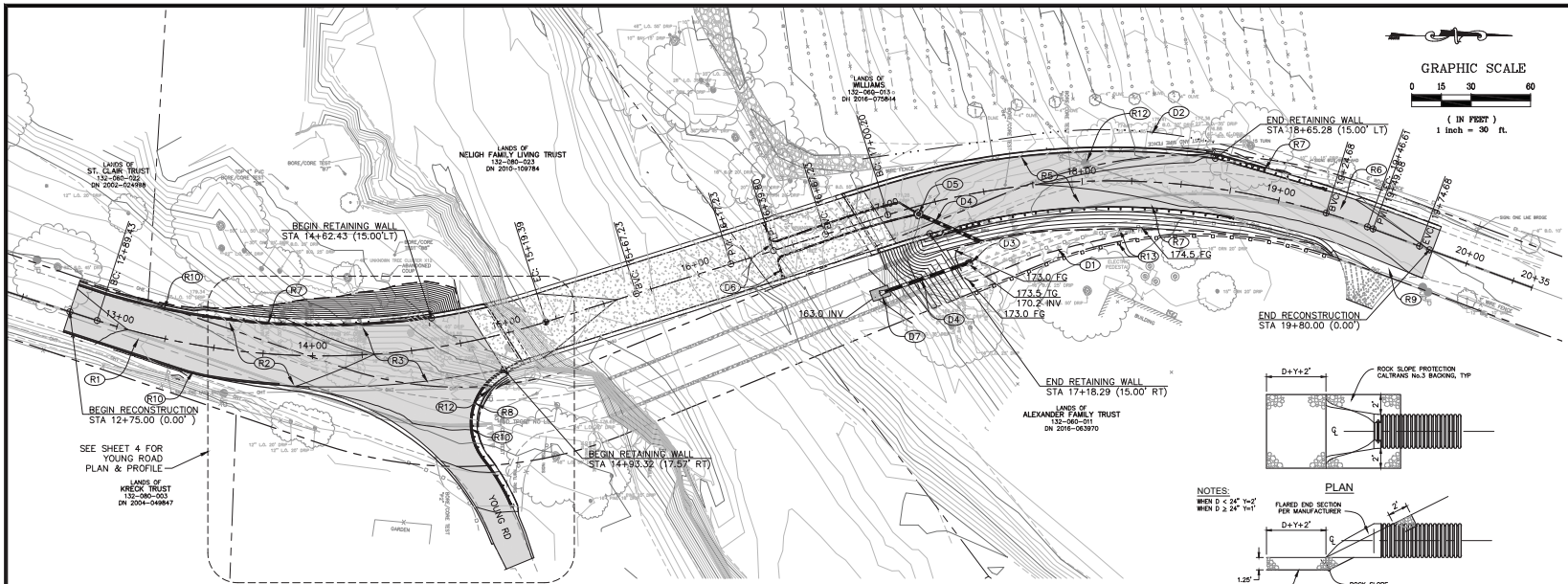
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

TYPICAL SECTIONS

CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	3
TOTAL SHEETS	52

Xrefs: 013962_bs.dwg=013962_ex.dwg
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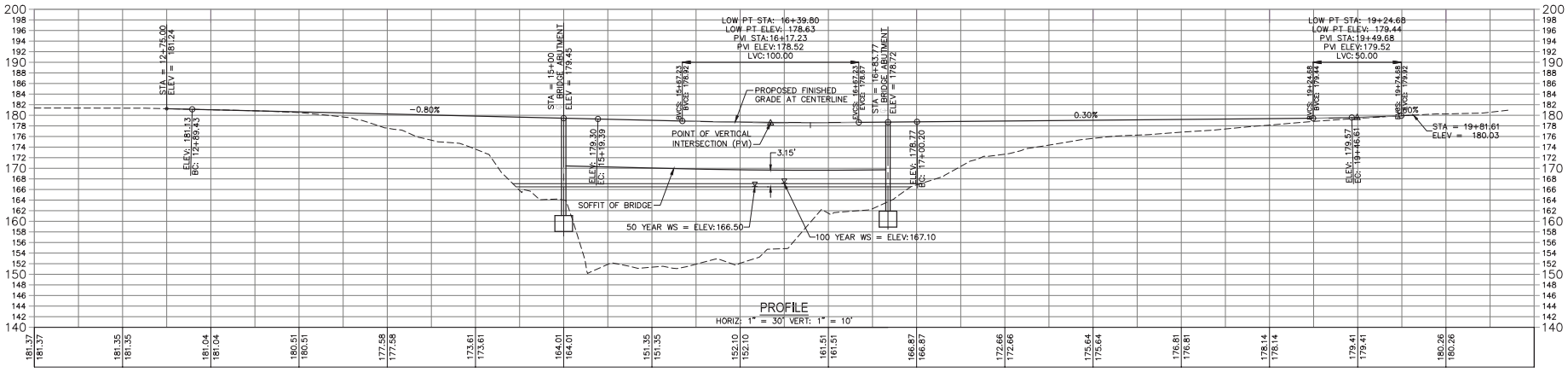
CONSTRUCTION NOTES

- (D1) BIORETENTION AREA SEE SECTION (7/3)
- (D2) REGRADE SWALE.
- (D3) INSTALL 24"x 24" DROP INLET PER SECTION (7/3)
- (D4) INSTALL 18" STORM DRAIN PIPE.
- (D5) INSTALL STORM DRAIN MANHOLE.
- (D6) SEE BRIDGE PLANS FOR DECK DRAINS & PIPING.
- (D9) INSTALL FLARED END SECTION & OUTFALL PROTECTION PER DETAIL (1/4)
- (R1) INSTALL ROAD PER TYPICAL SECTION (1/3)
- (R2) INSTALL ROAD PER TYPICAL SECTION (2/3)
- (R3) INSTALL ROAD PER TYPICAL SECTION (3/3)
- (R4) INSTALL ROAD PER TYPICAL SECTION (4/3)
- (R5) INSTALL ROAD PER TYPICAL SECTION (5/3)
- (R6) INSTALL ROAD PER TYPICAL SECTION (6/3)
- (R7) INSTALL METAL BEAM GUARD RAIL AND SRT-31 TERMINAL SYSTEM.
- (R8) INSTALL METAL BEAM GUARD RAIL WITH 3/4 WRAP END SECTION.
- (R9) AC CONFORM TO EXISTING CONCRETE DRIVEWAY.
- (R10) INSTALL AC DIKE TYPE A PER CALTRANS STD. PLAN A87B.
- (R12) JOINT POLE TO BE RELOCATED BY OTHERS.
- (R13) EXISTING WIRE FENCE TO BE RELOCATED AND SET 1' BEHIND PROPERTY LINE.

TYPICAL STORM DRAIN OUTFALL DETAIL (1/-)
NOT TO SCALE

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CHALK HILL CL-2021,05,07 PROFILE



DWG. C-2

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_SP-BOX-GIRDER-SAG.DWG 6/3/2021

REGISTERED PROFESSIONAL ENGINEER — HEIDI E. UTTERBACK — No. 53723 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION COMPLETED:
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RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

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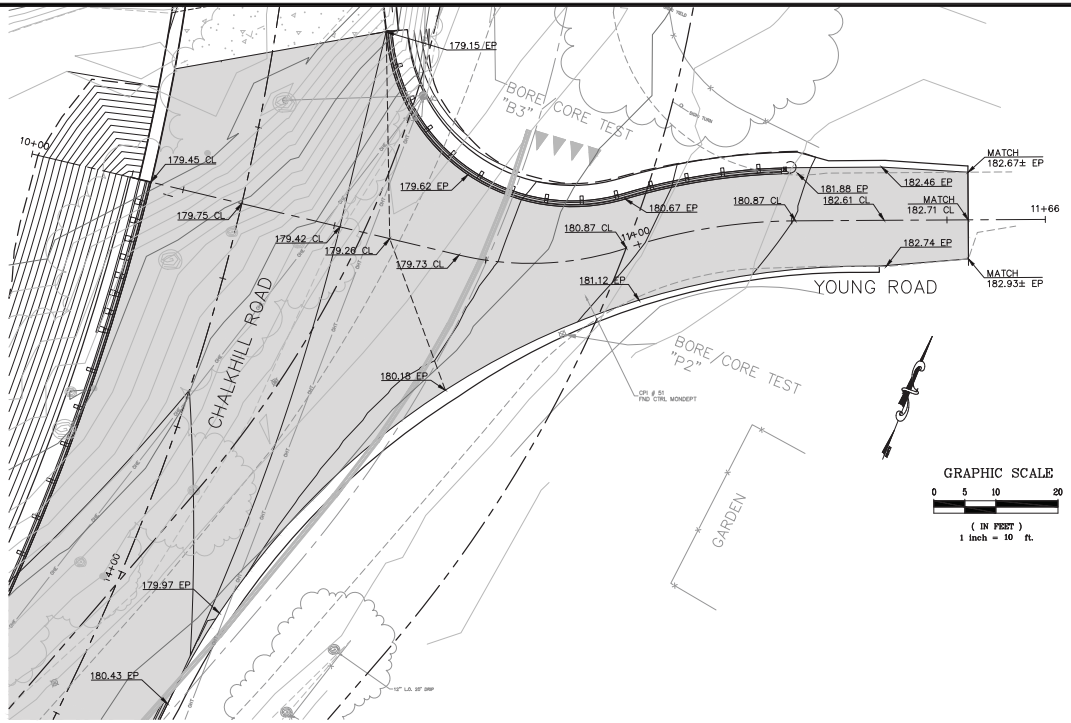
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

PLAN AND PROFILE - CHALK HILL ROAD

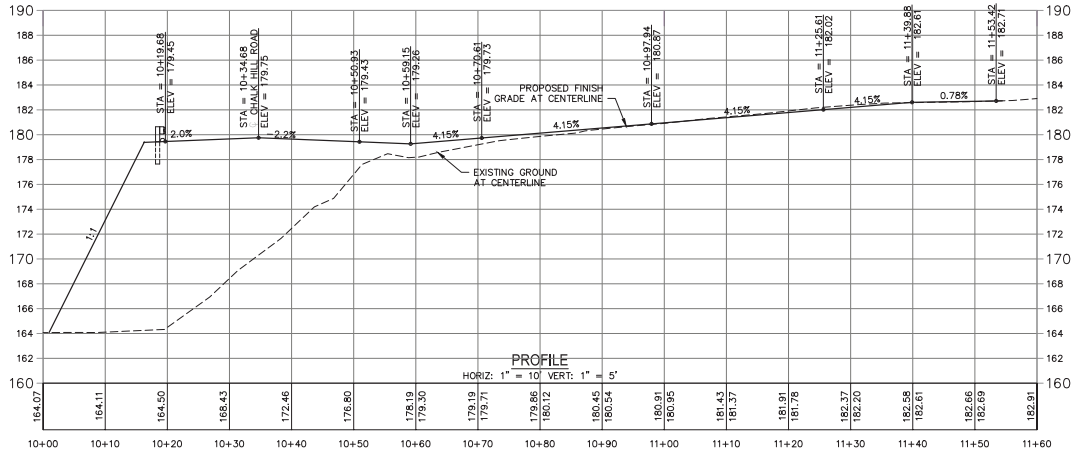
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	4
TOTAL SHEETS	52

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CL YOUNG ROAD PROFILE



PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

DWG. C3

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_SP YOUNG.DWG 6/3/2021

REGISTERED PROFESSIONAL ENGINEER HEIDI E. UTTERBACK No. 53723 CIVIL STATE OF CALIFORNIA

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

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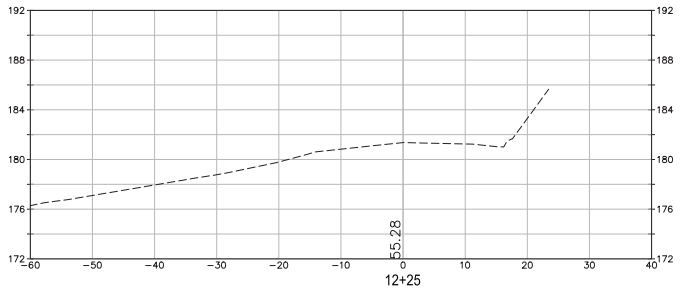
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

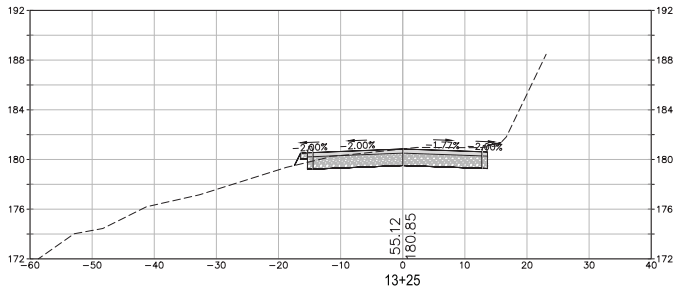
PLAN AND PROFILE - YOUNG ROAD

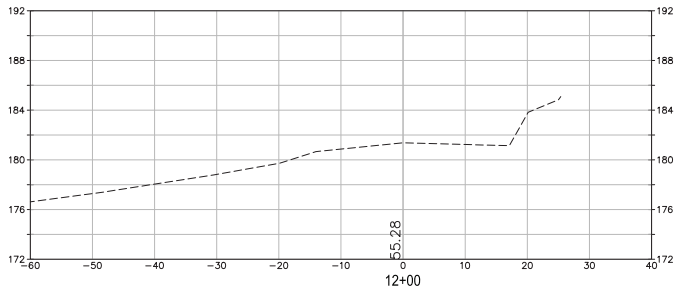
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

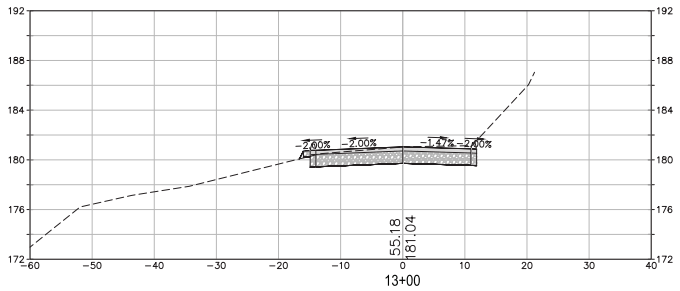
ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	5
TOTAL SHEETS	52

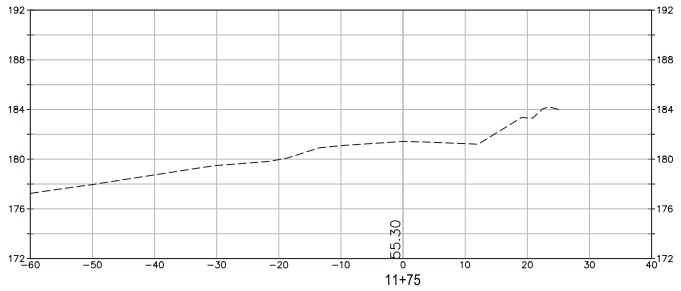
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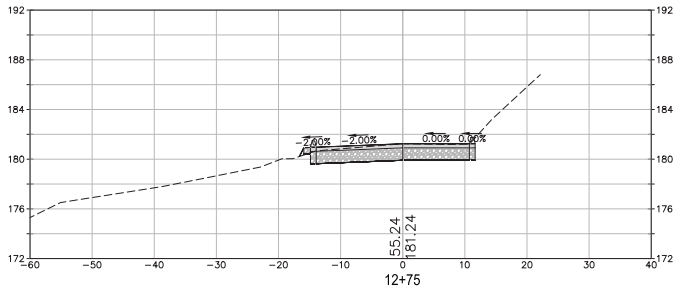


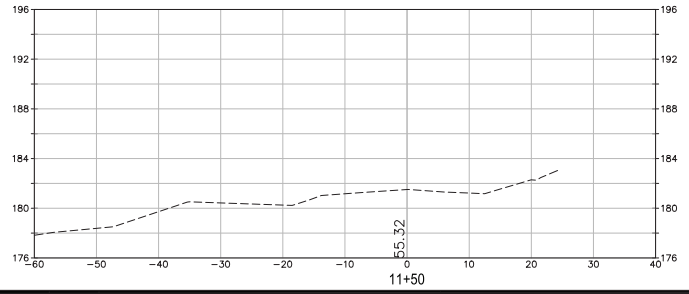


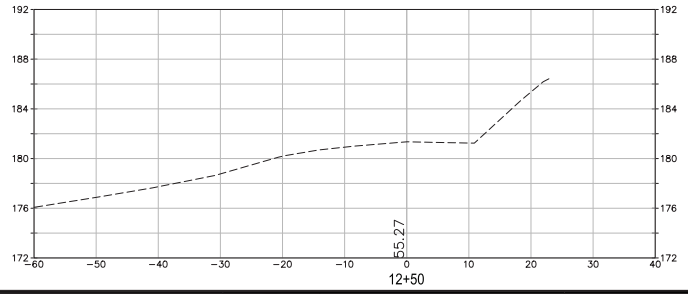












PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10'
VERT. 1"=5'

DWG. C-4

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
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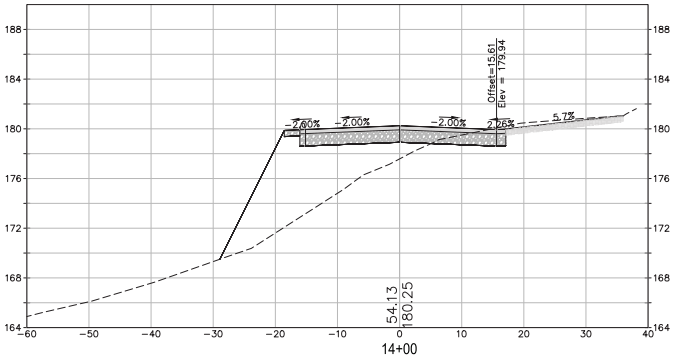
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

CROSS SECTIONS - STA 11+50 TO STA 13+75

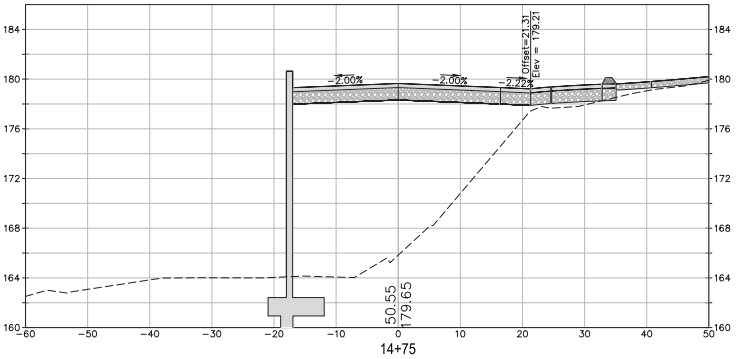
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	6
TOTAL SHEETS	52

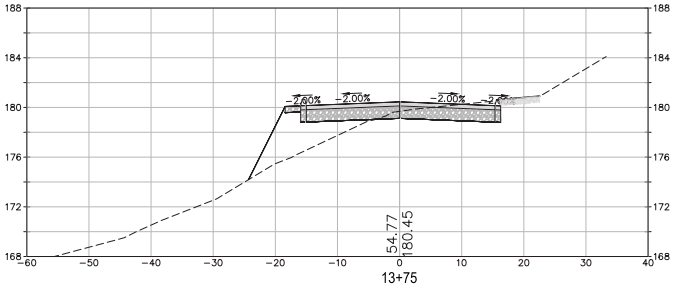
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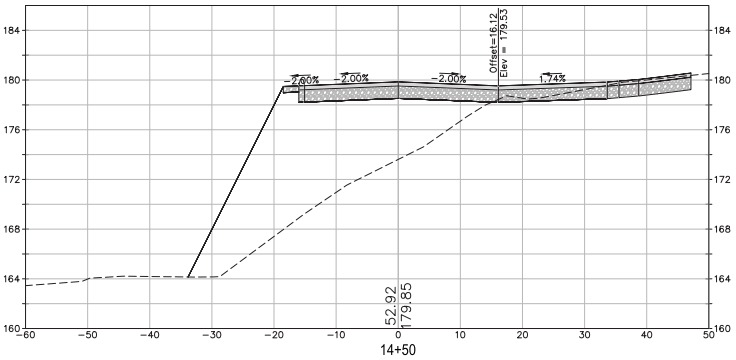
14+00



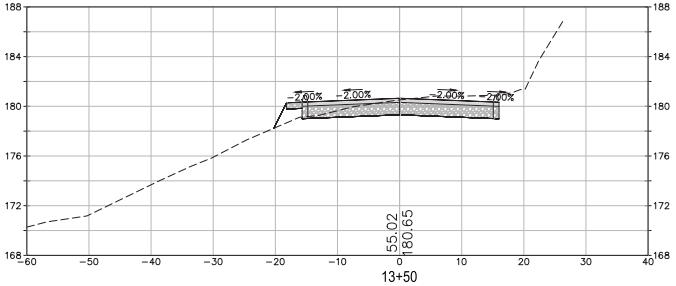
14+75



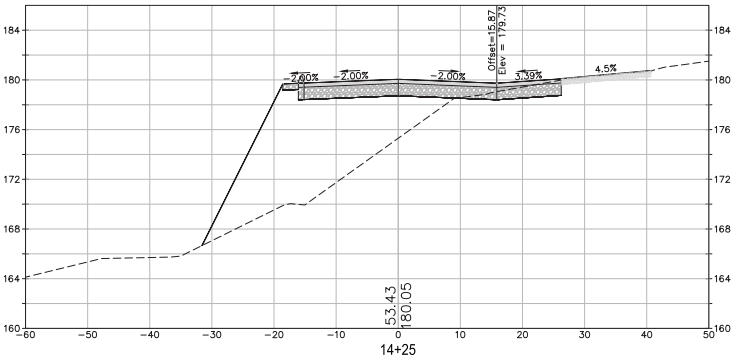
13+75



14+50



13+50



14+25

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10'
VERT. 1"=5'

DWG. C-5

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

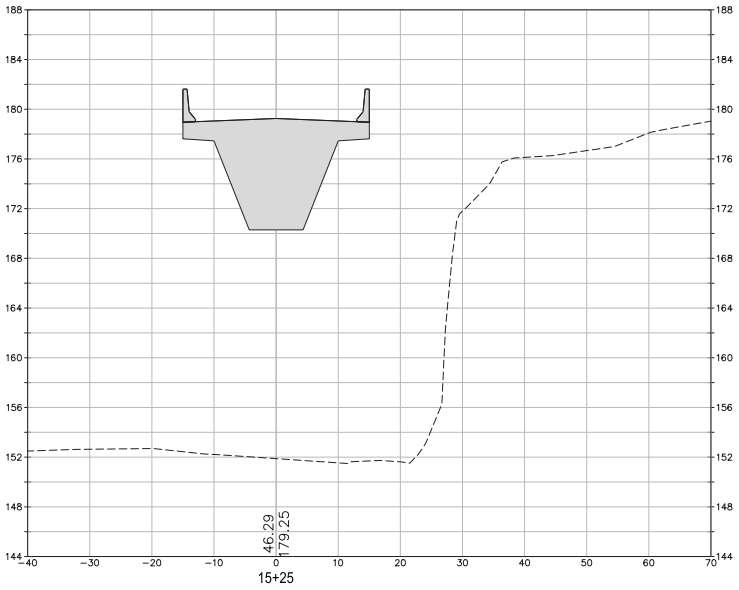
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

CROSS SECTIONS - STA 13+50 TO STA 14+75

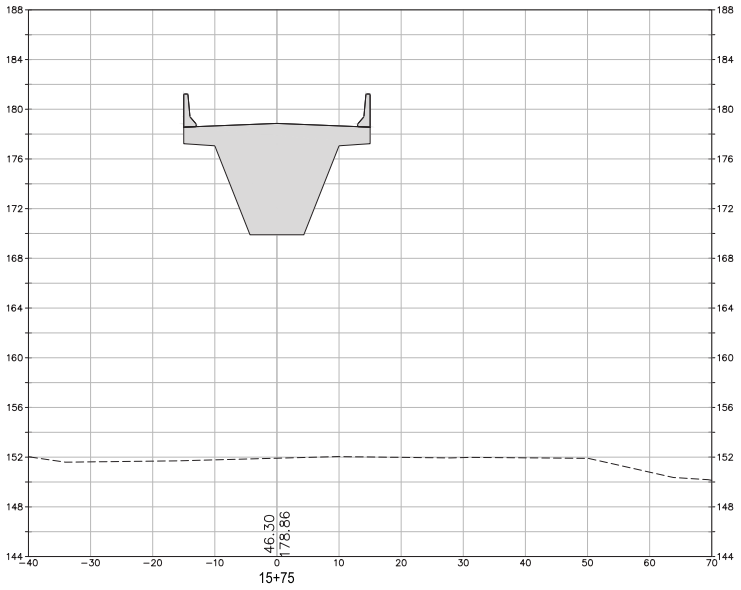
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	7
TOTAL SHEETS	52

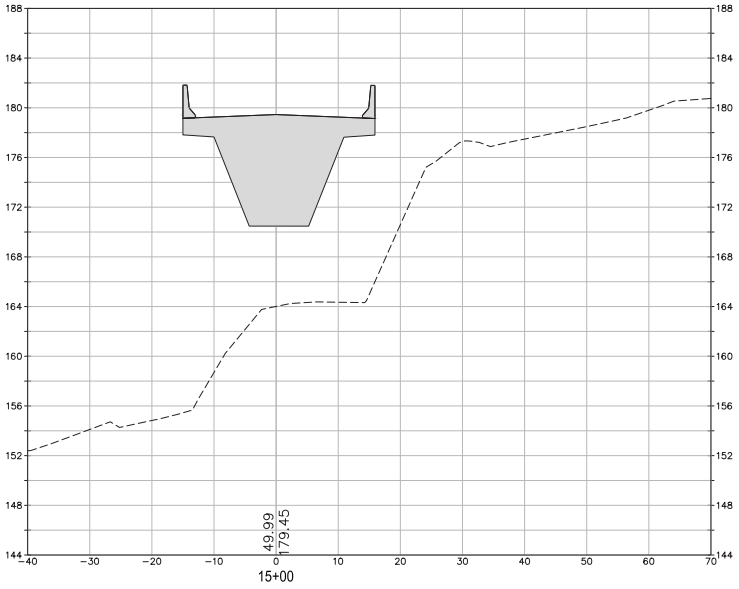
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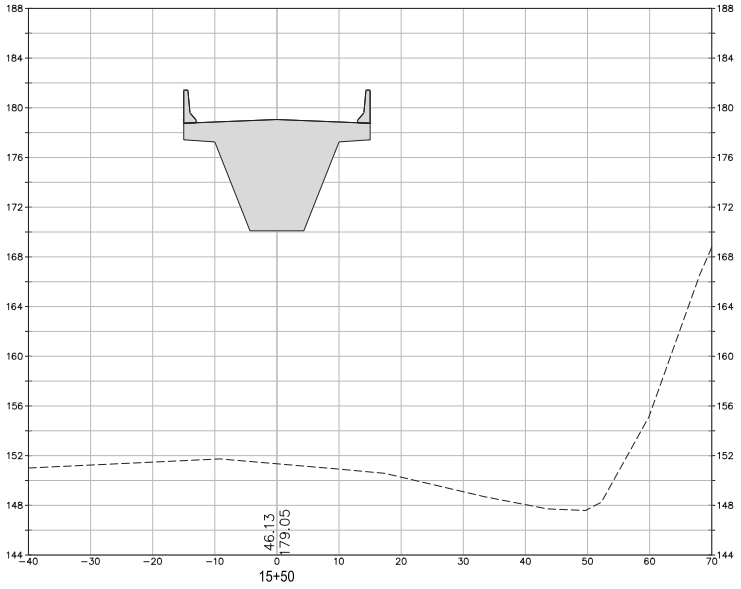
15+25



15+75



15+00



15+50

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10' VERT. 1"=5'

DWG. C-6

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

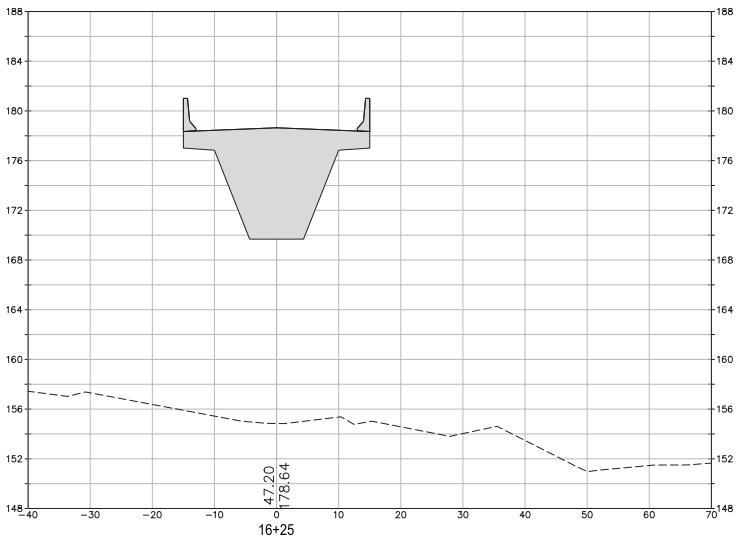
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

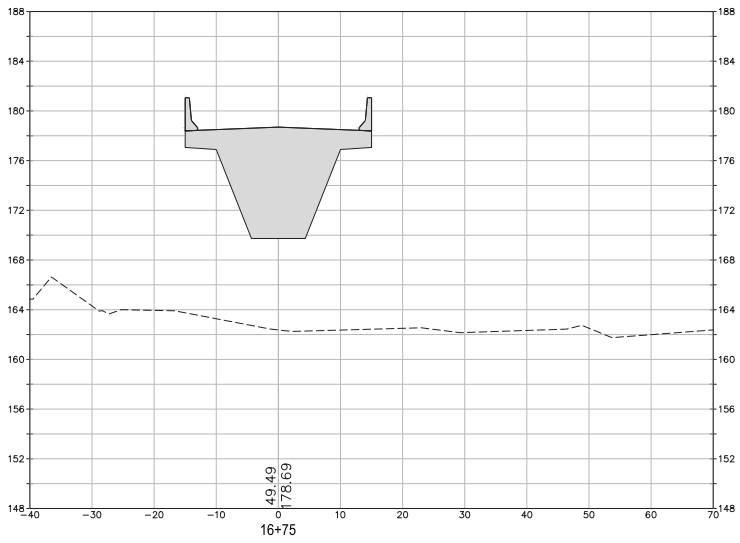
CROSS SECTIONS - STA 15+00 TO STA 15+75

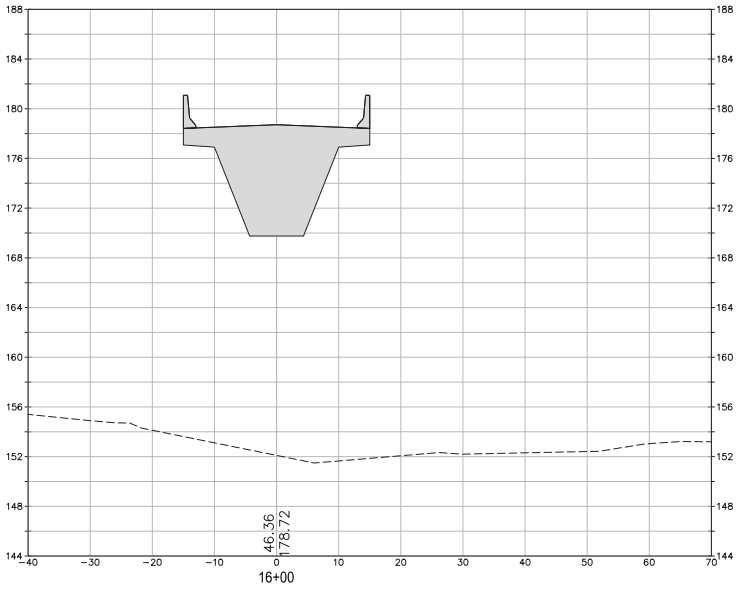
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

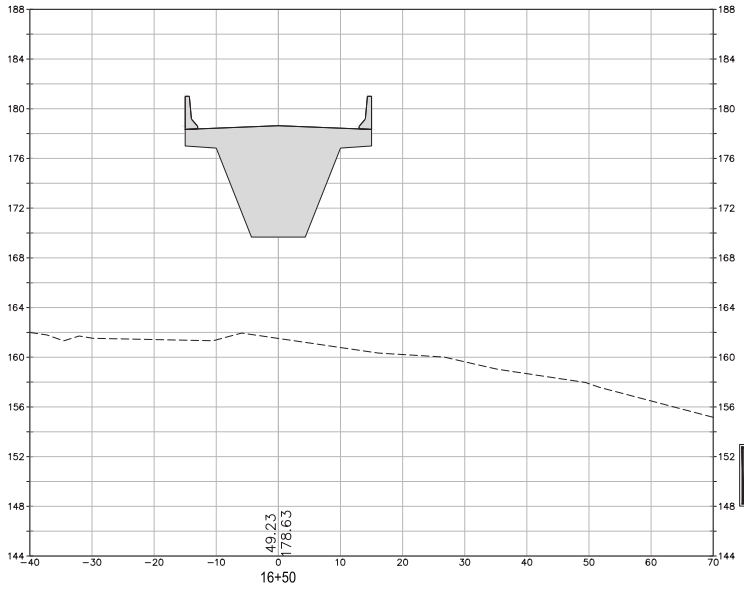
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BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	8
TOTAL SHEETS	52

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Plot: F:\Cycle 3\Projects\013962 Chalk Hill Bridge\DWG\013962_Corr-Box-Girder-SAG.dwg Layout Name: CMC C-6 Plot Date: Jun 04, 2021 at 08:29









PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10'
VERT. 1"=5'

DWG. C-7

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

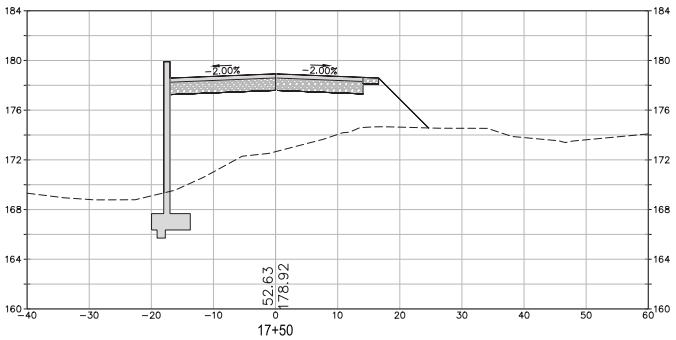
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

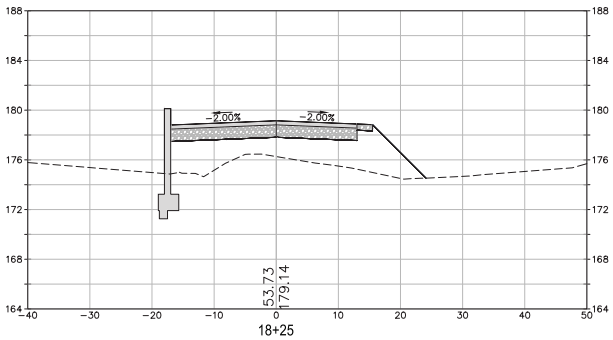
CROSS SECTIONS - STA 16+50 TO STA 16+75

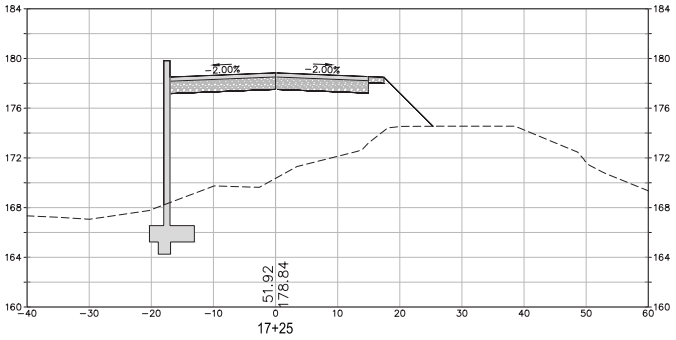
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

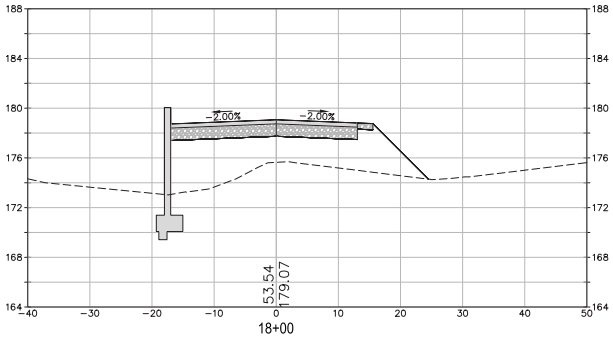
ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	9
TOTAL SHEETS	52

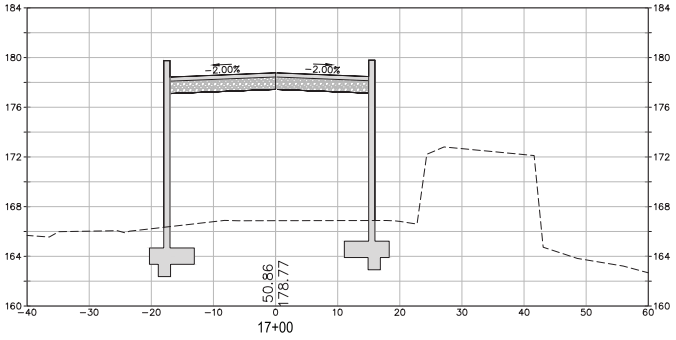
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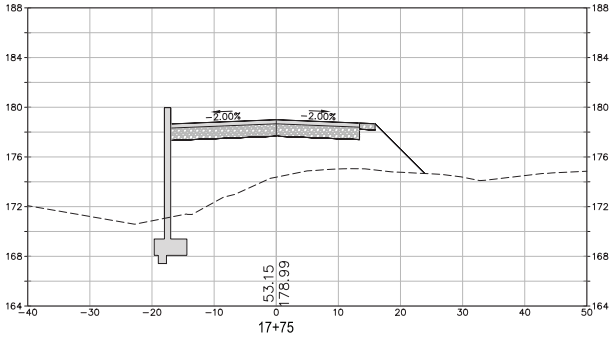












PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10'
VERT. 1"=5'

DWG. C-8

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

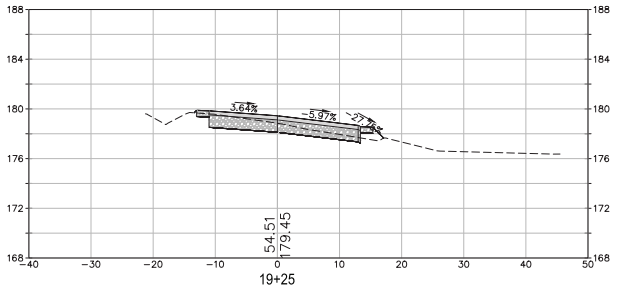
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

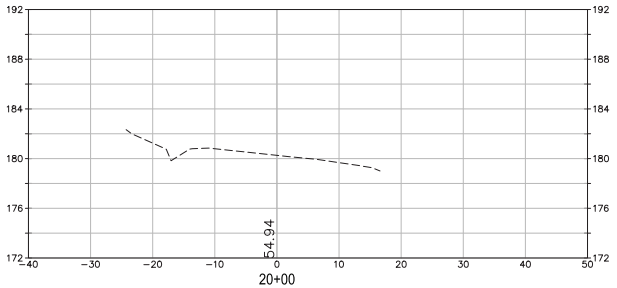
CROSS SECTIONS - STA 17+00 TO STA 18+25

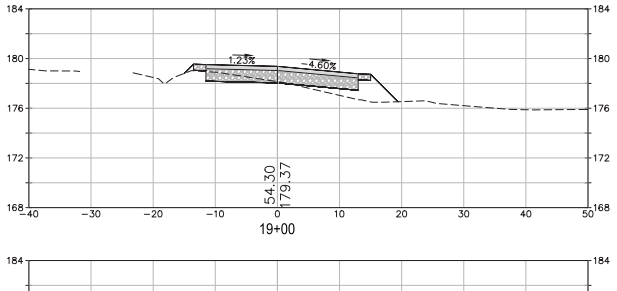
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

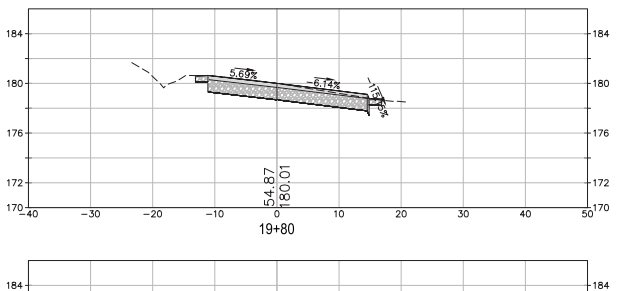
ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	10
TOTAL SHEETS	52

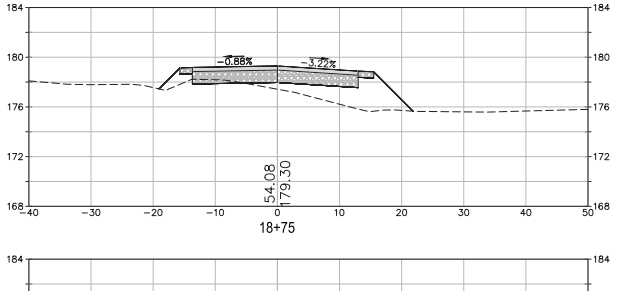
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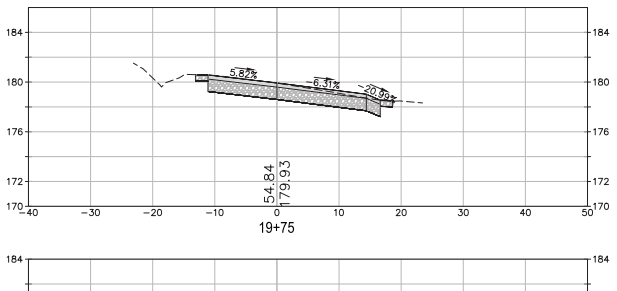


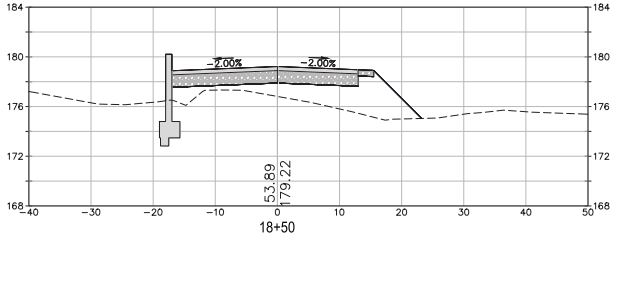


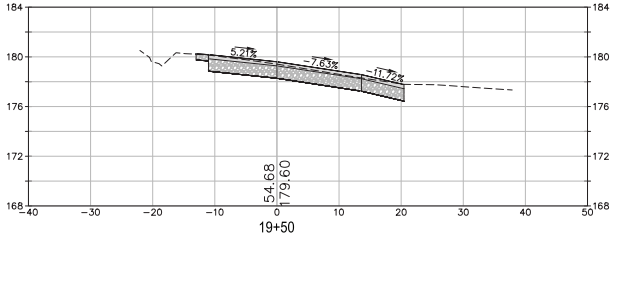












PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10'
VERT. 1"=5'

DWG. C-9

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

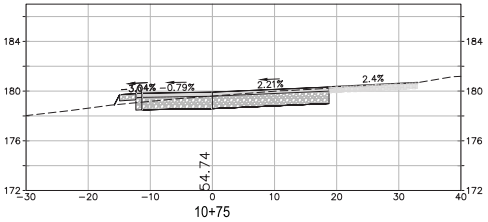
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

CROSS SECTIONS - STA 18+50 TO STA 20+00

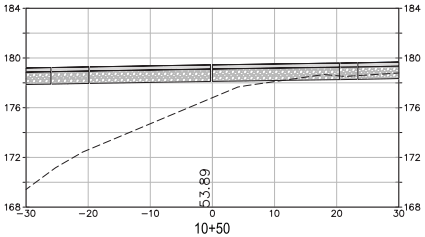
CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	11
TOTAL SHEETS	52

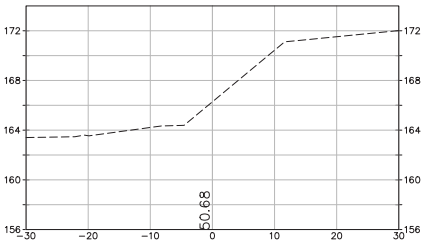
Image: I:\DPW-Engr-10105.05\...\Hydro_013962_Ja-Aug\013962_Ja-Aug\013962_Box-Girder-Layout-20201116.dwg\013962_Box-Girder-Layout.dwg
Plot: F:\Job 3\Projects\013962 Chalk Hill Bridge\DWG\013962_Cor-Box-Girder-SAG.dwg Layout Name: CWC C-9 Plot Date: Jun 04, 2021 at 08:30



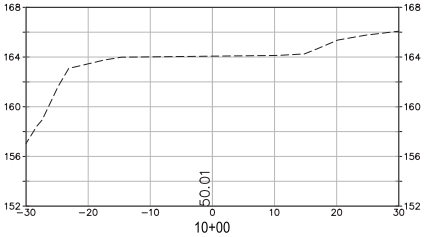
10+75



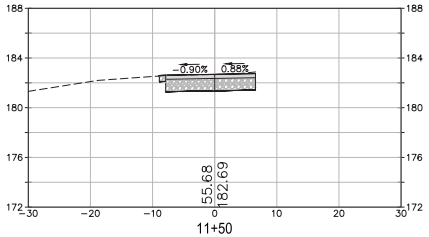
10+50



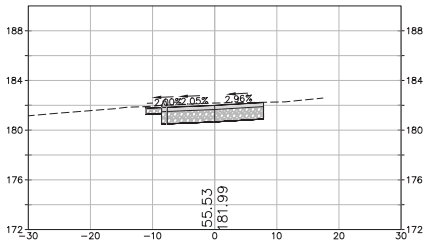
10+25



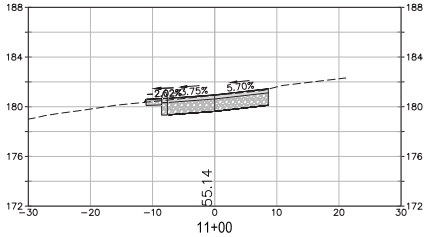
10+00



11+50



11+25



11+00

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

CROSS SECTION SCALES
HORIZ. 1"=10'
VERT. 1"=5'

DWG. C-10

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_CORR-BOX-GIRDER-SAG.DWG 6/3/2021

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

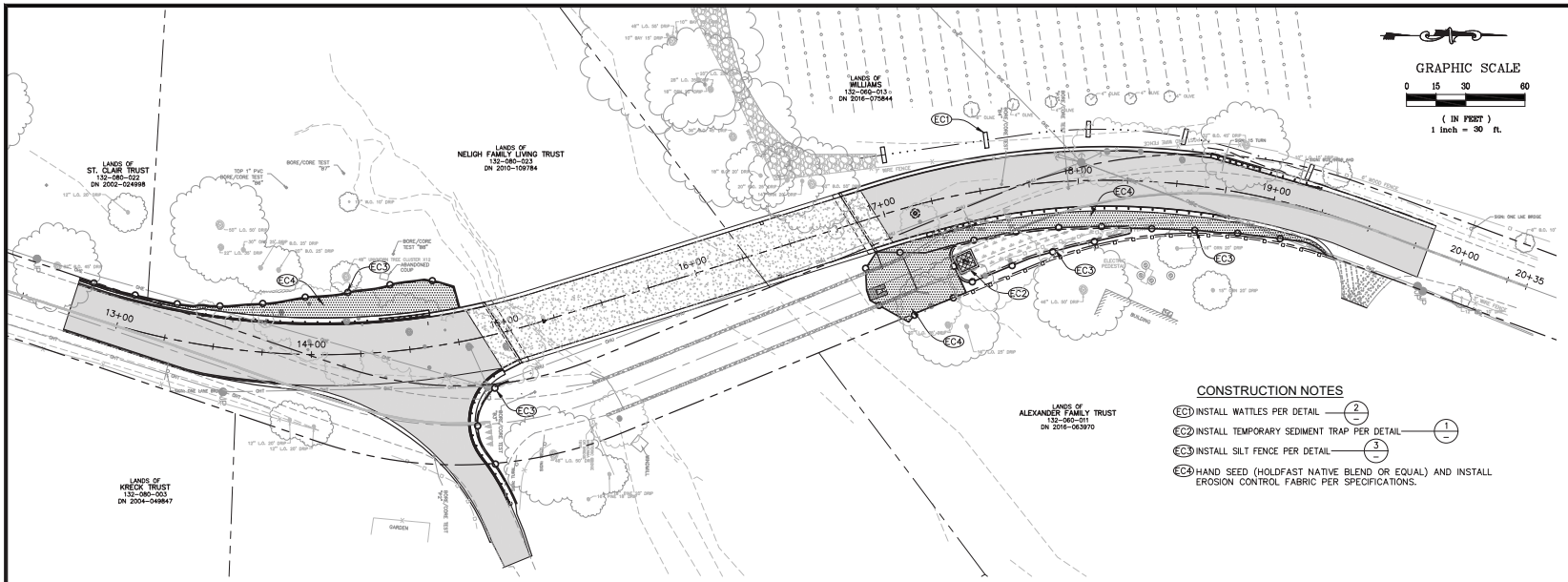
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

YOUNG ROAD CROSS SECTIONS

CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	12
TOTAL SHEETS	52

Image: I:\BPM-logo-100105.tif Xrefs: 013962_Ex-Key.DWG 013962_Ex-Key.DWG 013962_Box-Girder-Layout-20201116.dwg 013962_Box-Girder-Layout.dwg
Path: F:\Cycle 3\Projects\013962 Chalk Hill Bridge\013962_Corr-Box-Girder-SAG.dwg Layout Name: CMG C-10 Plot Date: Jun 04, 2021 at 09:30



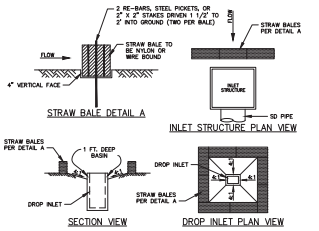
CONSTRUCTION NOTES

(EC1) INSTALL WATTLES PER DETAIL 2/-

(EC2) INSTALL TEMPORARY SEDIMENT TRAP PER DETAIL 1/-

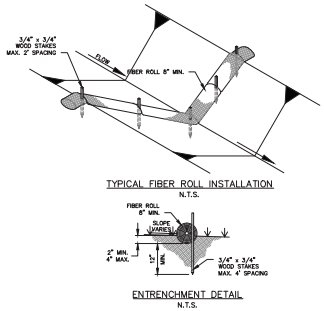
(EC3) INSTALL SILT FENCE PER DETAIL 3/-

(EC4) HAND SEED (HOLDFAST NATIVE BLEND OR EQUAL) AND INSTALL EROSION CONTROL FABRIC PER SPECIFICATIONS.



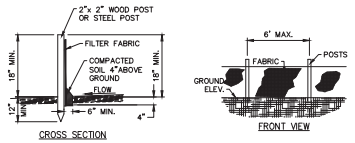
TEMPORARY SEDIMENT TRAP DETAIL 1/-

NOT TO SCALE



FIBER ROLLS (WATTLES) 2/-

NOT TO SCALE



SILT FENCE MAINTENANCE NOTES

1. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL MADE IMMEDIATELY.
2. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE BARRIER'S EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FENCE SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.

SILT FENCE DETAIL 3/-

NOT TO SCALE

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

DWG. C-11

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_EROSION.DWG 6/3/2021

REGISTERED PROFESSIONAL ENGINEER — HEIDI E. UTTERBACK — No. 53723 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION COMPLETED:

"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

RESIDENT ENGINEER

AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

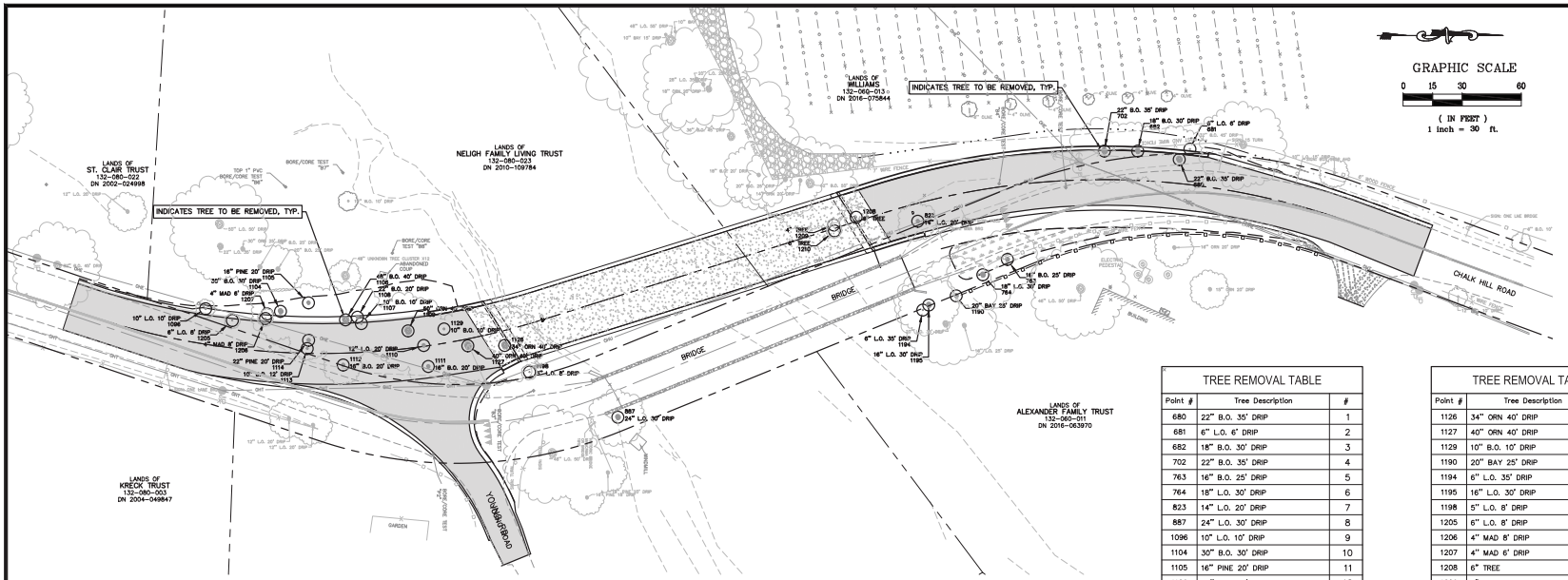
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

EROSION CONTROL PLAN

CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	13
TOTAL SHEETS	52

Xrefs: 013962_gx-Box-Girder-540.dwg,013962_ba.dwg,013962_rw.dwg,013962_Box-Girder-layout.dwg
Images: DTP#-logo-10X10.tif,DTP#-logo-10X10.tif
Path: F:\Civil 3D Projects\013962 Chalk Hill Bridge\DWG\013962_EROSION.dwg Layout Name: CHALK HILL EROSION Plot Date: Jun 04, 2021 at 09:30 am



GENERAL TREE NOTES

1. THE CONTRACTOR SHALL NOT REMOVE ANY TREES UNTIL THEY HAVE BEEN MARKED OR TAGGED BY THE ENGINEER.

TREE ABBREVIATIONS

MAD	INDICATES MADRONE
BO	INDICATES BLACK OAK
LO	INDICATES LIVE OAK
ORN	INDICATES ORNAMENTAL

TREE REMOVAL TABLE

Point #	Tree Description	#
680	22" B.O. 35' DRIP	1
681	6" L.O. 6' DRIP	2
682	18" B.O. 30' DRIP	3
702	22" B.O. 35' DRIP	4
763	16" B.O. 25' DRIP	5
764	18" L.O. 30' DRIP	6
823	14" L.O. 20' DRIP	7
887	24" L.O. 30' DRIP	8
1096	10" L.O. 10' DRIP	9
1104	30" B.O. 30' DRIP	10
1105	16" PINE 20' DRIP	11
1106	48" B.O. 40' DRIP	12
1107	10" B.O. 10' DRIP	13
1108	22" B.O. 20' DRIP	14
1109	50" ORN 40' DRIP	15
1110	12" L.O. 20' DRIP	16
1111	16" B.O. 20' DRIP	17
1112	16" B.O. 20' DRIP	18
1113	10" B.O. 12' DRIP	19
1114	22" PINE 20' DRIP	20

TREE REMOVAL TABLE

Point #	Tree Description	#
1126	34" ORN 40' DRIP	21
1127	40" ORN 40' DRIP	22
1129	10" B.O. 10' DRIP	23
1190	20" BAY 25' DRIP	24
1194	6" L.O. 35' DRIP	25
1195	16" L.O. 30' DRIP	26
1198	5" L.O. 8' DRIP	27
1205	6" L.O. 8' DRIP	28
1206	4" MAD 8' DRIP	29
1207	4" MAD 6' DRIP	30
1208	6" TREE	31
1209	4" TREE	32
1210	6" TREE	33

PRELIMINARY
35% SUBMITTAL
DATE: JUNE 2021

DWG. C-12

DESIGN BY	WJK
DRAWING BY	WJK
CHECKED BY	HEU

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

FILENAME: 013962_TREE REMOVAL.DWG 6/3/2021

REGISTERED PROFESSIONAL ENGINEER — HEIDI E. UTTERBACK — No. 53723 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION COMPLETED:
"AS BUILT" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
RESIDENT ENGINEER
AS BUILT DRAWINGS BY:

DATE	REVISION	BY	APPROVED

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, DIRECTOR

TREE REMOVAL PLAN

CHALK HILL ROAD
OVER MAACAMA CREEK
BRIDGE REPLACEMENT PROJECT

ROAD NUMBER	9999A
BUDGET NUMBER	C09999
FISCAL YEAR	2020-21
SHEET NUMBER	14
TOTAL SHEETS	52

Xrefs: 013962_bs.dwg 013962_ex.dwg 013962_ex-Box-Girder-SAC.dwg 013962_Box-Girder-layout.dwg
Images: D17#-logo-10X10.tif D17#-logo-10X10.tif
Path: F:\Civil 3D Projects\013962 Chalk Hill Bridge\DWG\013962_TREE REMOVAL.dwg Layout Name: CHALK HILL TREE REMOVAL Plot Date: Jun 04, 2021 at 09:30 am

2018 STANDARD PLANS LIST

ABBREVIATIONS, LINES, SYMBOLS, AND LEGEND
A3A Abbreviations (Sheet 1 of 3)
A3B Abbreviations (Sheet 2 of 3)
A3C Abbreviations (Sheet 3 of 3)

PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS
A20A Pavement Markers and Traffic Lines - Typical Details
A24D Pavement Markings Words
RSP A24E Pavement Markings Words, Limit & Yield Lines

EXCAVATION AND BACKFILL
A62C Limits of Payment for Excavation and Backfill - Bridge
A62F Excavation and Backfill Metal and Plastic Culverts

MIDWEST GUARDRAIL SYSTEM - STANDARD RAILING SECTIONS
A77L2 Midwest Guardrail System Standard Railing Section (Steel Post with Notched Wood or Notched Recycled Plastic Block)
A77M1 Midwest Guardrail System - Standard Hardware
A77N2 Midwest Guardrail System - Steel Post and Notched Wood Block Details
RSP A77N3 Midwest Guardrail System - Typical Line Post Embedment and Hinge Point Offset Details
A77N4 Midwest Guardrail System Typical Railing Delineation and Dike Positioning Details

MIDWEST GUARDRAIL SYSTEM - TYPICAL LAYOUTS FOR STRUCTURES
A77Q1 Midwest Guardrail System - Typical Layouts for Structure Approach
A77Q4 Midwest Guardrail System - Typical Layouts for Structure Departure

MIDWEST GUARDRAIL SYSTEM - END ANCHORAGE AND RAIL TENSIONING ASSEMBLY
A77S1 Midwest Guardrail System - End Anchor Assembly (Type SFT)
A77S3 Metal Railing Anchor Cable and Anchor Plate Details

MIDWEST GUARDRAIL SYSTEM - CONNECTION DETAILS AND TRANSITION RAILING TO BRIDGE RAILINGS, ABUTMENTS AND WALLS
A77U1 Midwest Guardrail System Connections to Bridge Railings without Sidewalks Details No. 1
A77U4 Midwest Guardrail System Transition Railing (Type WB-31)

CURBS, DRIVEWAYS, DIKES, CURB RAMPS, AND ACCESSIBLE PARKING
A87B Hot Mix Asphalt Dikes

PAVEMENTS
P51 Edge Drain Outlet and Vent Details
P52 Edge Drain Cleanout and Vent Details
P53 Cross Drain Interceptor Details
P70 Hot Mix Asphalt Paving (Longitudinal Tapered Notched Wedge Joint)
P75 Pavement Edge Treatments - Overlays
P76 Pavement Edge Treatments - New Construction

DRAINAGE INLETS, PIPE INLETS AND GRATES
D72A CIP DRAINAGE INLETS - TYPES OS, OL AND GOL
D72B CIP DRAINAGE INLETS - TYPES G1, G2, G3, G4, G5 AND G6
D72C CIP DRAINAGE INLETS - TYPES G1, G2, G3, G4, G5 AND G6
D72D CIP DRAINAGE INLETS - TYPES GT1, GT2, GT3 AND GT4
D72E CIP DRAINAGE INLETS - TYPES GO AND GDO

FLARED END SECTIONS
D94A Metal and Plastic Flared End Sections
D94B Concrete Flared End Sections

TEMPORARY TRAFFIC CONTROL SYSTEMS
T9 Traffic Control System Tables for Lane and Ramp Closures

TEMPORARY WATER POLLUTION CONTROL
T51 Temporary Water Pollution Control Details (Temporary Silt Fence)
T52 Temporary Water Pollution Control Details (Temporary Straw Bale Barrier)
T53 Temporary Water Pollution Control Details (Temporary Cover)
T54 Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T55 Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T56 Temporary Water Pollution Control Details (Temporary Fiber Roll)
T57 Temporary Water Pollution Control Details (Temporary Check Dam)
T61 Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T65 Temporary Water Pollution Control Details (Temporary High-Visibility Fence)

BRIDGE DETAILS
RSP B0-1 Bridge Details
B0-3 Bridge Details
B0-5 Bridge Details
B0-13 Bridge Details

2018 STANDARD PLANS LIST (CONTINUED)

RETAINING WALLS
B3-5 Retaining Wall Details No. 1
B3-6 Retaining Wall Details No. 2

BOX GIRDER DETAILS
B7-1 Box Girder Details

DECK DRAINS
B7-3 Deck Drains - Type D-3
B7-8 Deck Drainage Details

UTILITY OPENING
B7-10 Utility Opening - Box Girder
B7-11 Utility Details

CAST-IN-PLACE POST-TENSIONED GIRDER
B8-5 Cast-In-Place Post-Tensioned Girder Details

STRUCTURE APPROACH
B9-4 Structure Approach - Type EQ (10)
B9-5 Structure Approach - Slab Details
B9-6 Structure Approach - Drainage Details

ROADSIDE SIGNS
RS1 ROADSIDE SIGNS - TYPICAL INSTALLATION DETAILS NO. 1

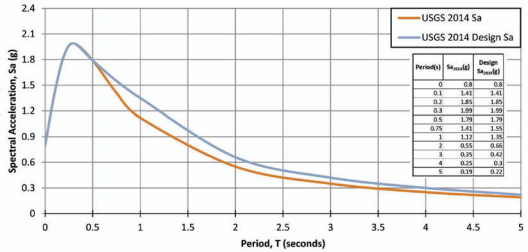
THE PROJECT GEOTECHNICAL ENGINEER SHALL:

1) Attend the project pre-construction conference to discuss project grading requirements and the Contractor's grading work plan and schedule.
2) Observe the excavation at areas to receive compacted fill to ensure that weak soils are removed and to recommend subdrain placement before the compacted fill is placed.
3) Evaluate imported and onsite materials prior to their use as fill.
4) Perform field tests to verify fill compaction.
5) Determine the need for inspection tubes in the CISS/CIDH piles.
6) Observe foundation excavations to verify suitable bearing materials are exposed and proper cleaning achieved prior to placement of reinforcing steel or concrete in strip footings, pilecaps and the CISS/CIDH piles.
7) Observe the bench cuts prior to placement of Rock Slope Protection along the south creekbank.
8) Evaluate soil and geologic conditions that differ from those presented in these construction contract documents and provide revised recommendations as needed.

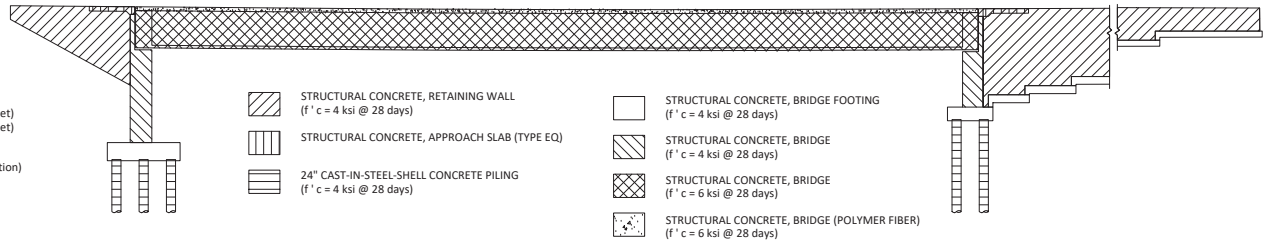
BRIDGE GENERAL NOTES
LOAD AND RESISTANCE FACTOR DESIGN

DESIGN:	AASHTO LRFD "Bridge Design Specifications," 8th edition with California Amendments
SEISMIC DESIGN:	Caltrans "Seismic Design Criteria" Version 2.0
DEAD LOADS:	Steel Unit Weight = 490 pcf Concrete Unit Weight = 150 pcf Future Wearing Surface = 35 psf
LIVE LOADS:	AASHTO HL-93
PERMIT LOADS:	California P15 Truck
TEMPERATURE:	T maxDesign = 80°F; T minDesign = 10°F
CONCRETE:	f'c = 4 ksi (Unless noted otherwise)
STEEL:	ASTM A709 Grade 36 or ASTM A36 (plate)
PRESTRESSING:	ASTM A416 Grade 270 low relaxation 7-wire strand ASTM A36 loose plate

Location: LAT=38.621873 LONG=-122.773933
Vs30=352m/s



ARS DESIGN CURVE



CONCRETE STRENGTH AND TYPE LIMITS
Scale: NTS

S01

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER
DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROULLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION
CONSTRUCTION COMPLETED:
RESIDENT ENGINEER
RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
–	–	–	–

OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

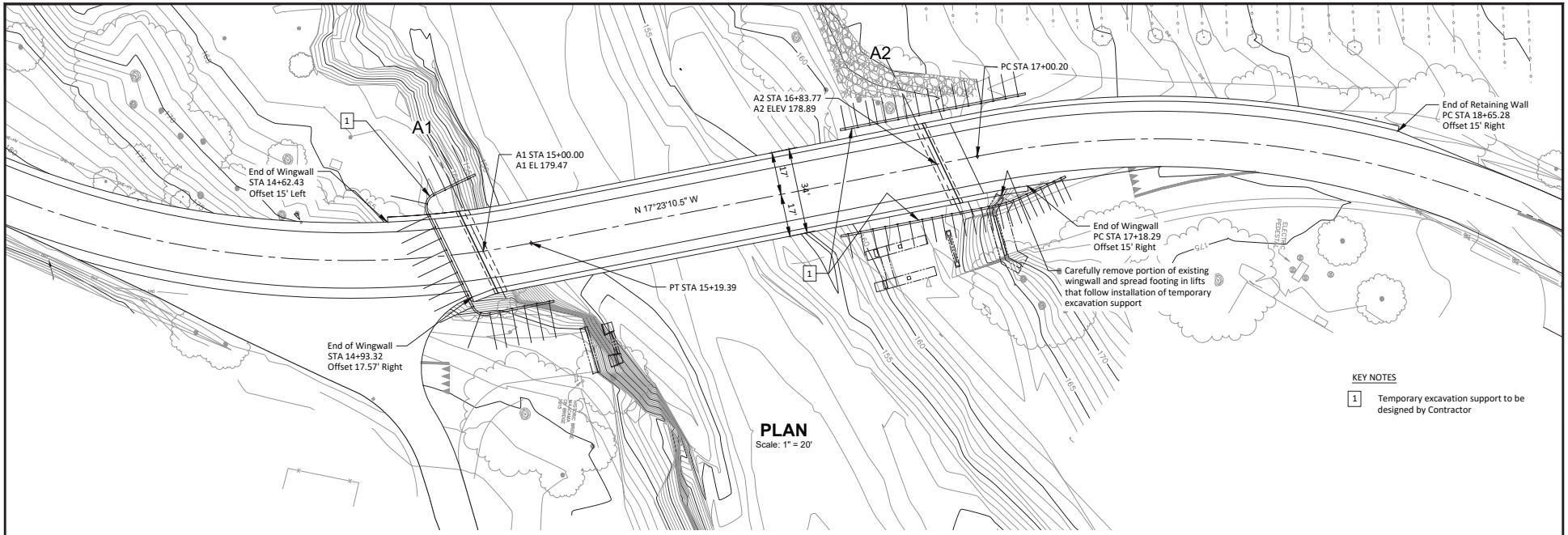
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

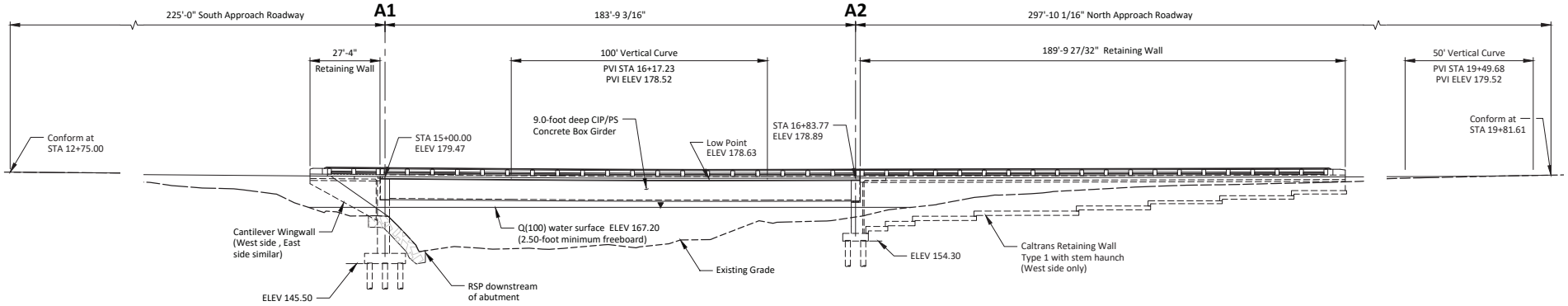
GENERAL NOTES (BRIDGE)

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	15
TOTAL SHEETS	52

FILENAME: CH-S01.DWG 6/3/2021 2:56 PM





DEVELOPED ELEVATION

Scale: 1" = 20'

S02

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

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"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
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OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

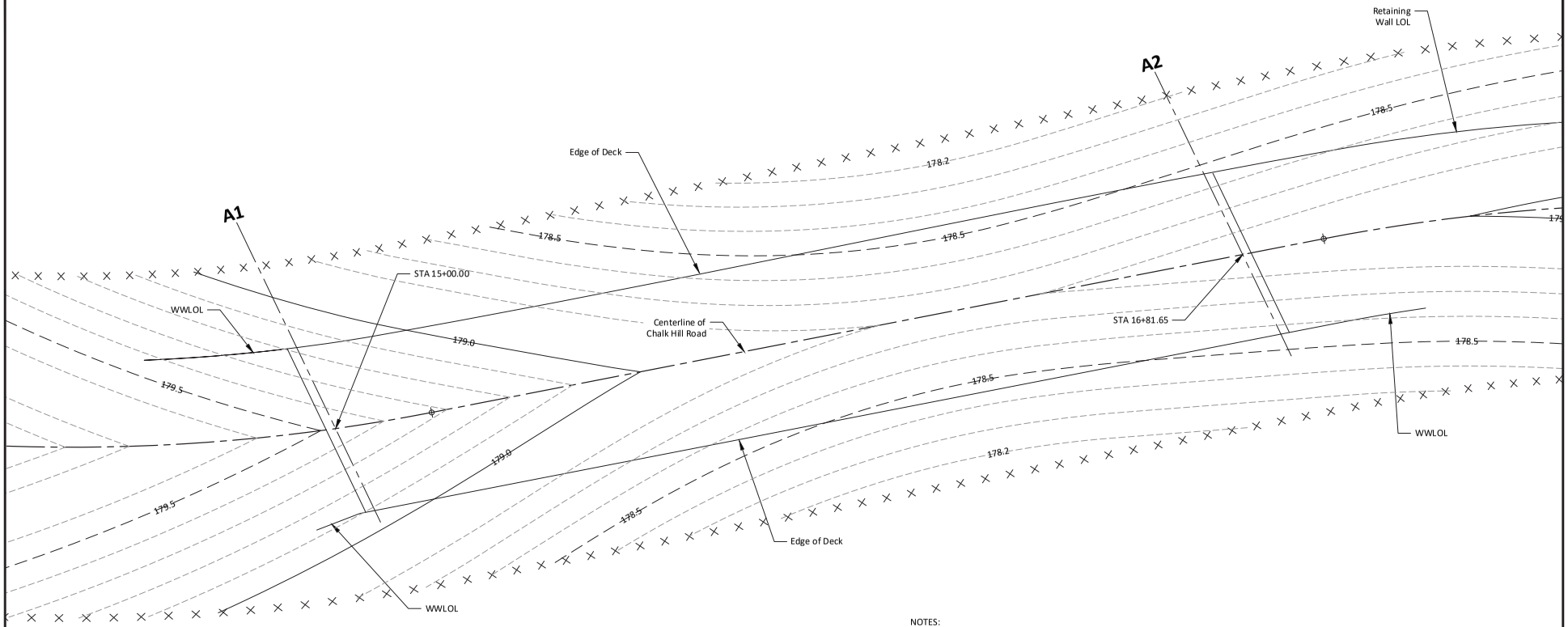
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

STRUCTURE PLAN

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	16
TOTAL SHEETS	52

FILENAME: CH-S02.DWG 6/3/2021 2:56 PM



NOTES:

1. Contours do not include camber or falsework settlement.
2. Contour interval is 0.1 feet.

X 5'-0" intervals measured along Chalk Hill Road centerline.

DECK CONTOURS

Scale: 1" = 1'-10'

N

S03

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROUILLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
–	–	–	–

OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

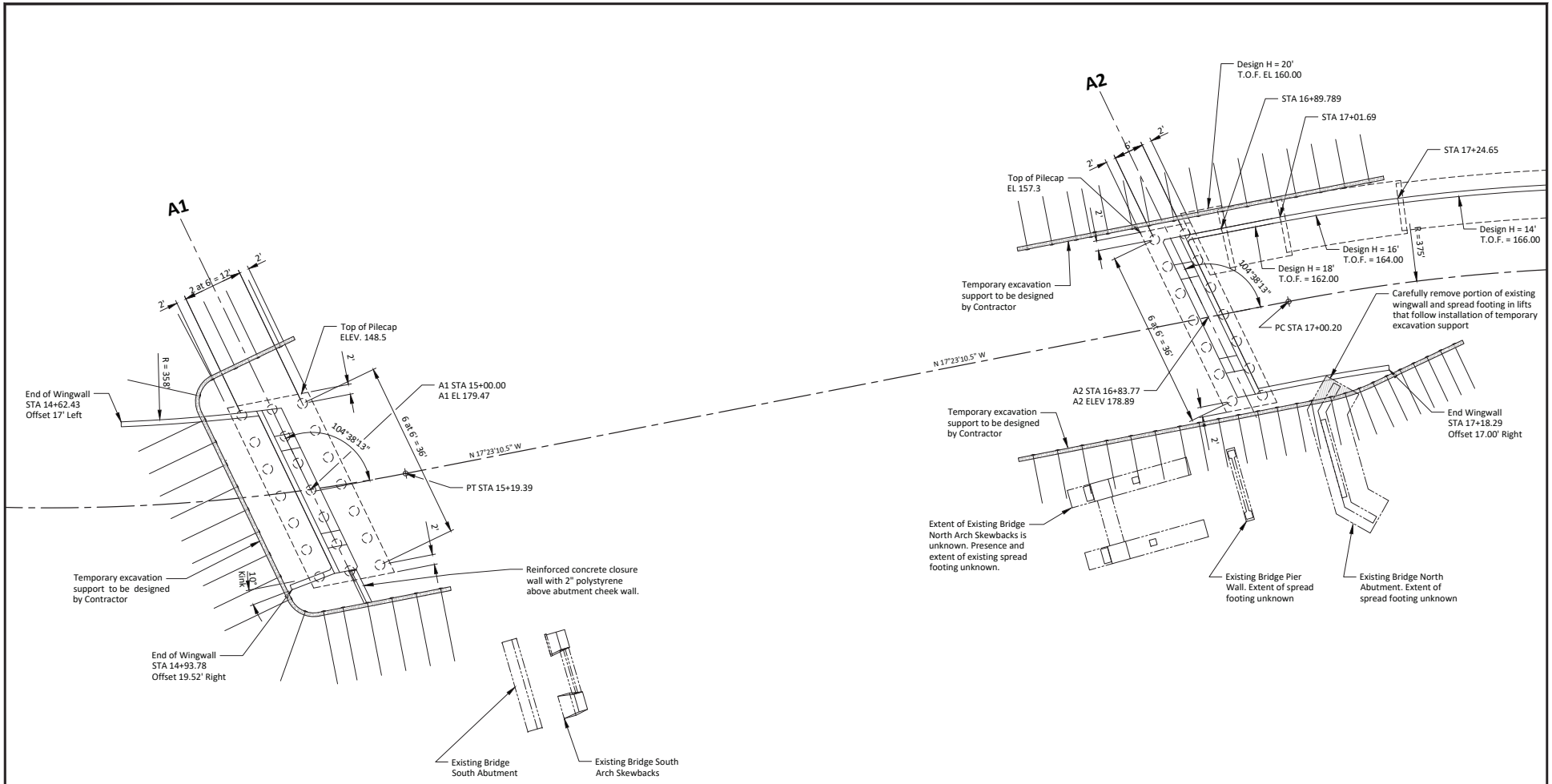
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

DECK CONTOUR PLAN

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	17
TOTAL SHEETS	52

FILENAME: CH-S03.DWG 6/3/2021 2:56 PM



FOUNDATION PLAN - 1

Scale: 1" = 10'

S04

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROUILLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
–	–	–	–

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(415) 989-4551 (415) 989-4135 fax

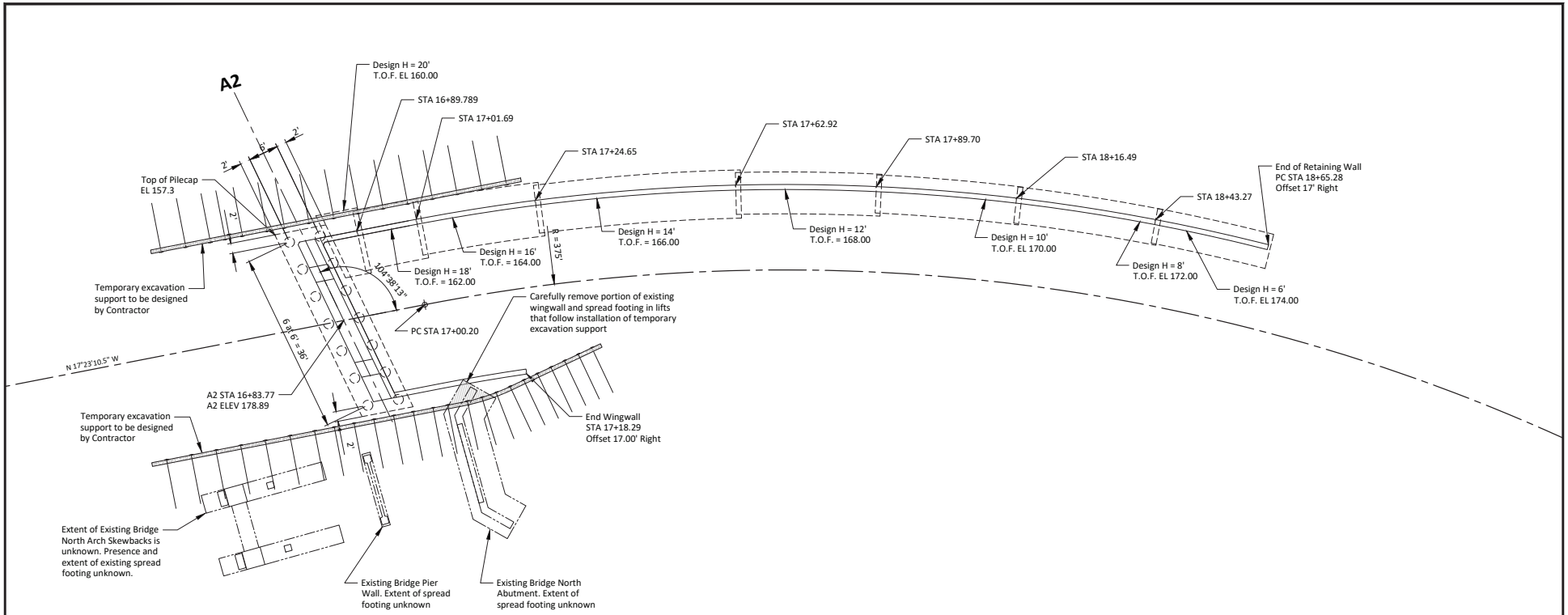
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

FOUNDATION PLAN 1

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	18
TOTAL SHEETS	52

FILENAME: CH-S04.DWG 6/3/2021 2:56 PM



FOUNDATION PLAN - 2

Scale: 1" = 10'

S05

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROLLINGER C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
–	–	–	–

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315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

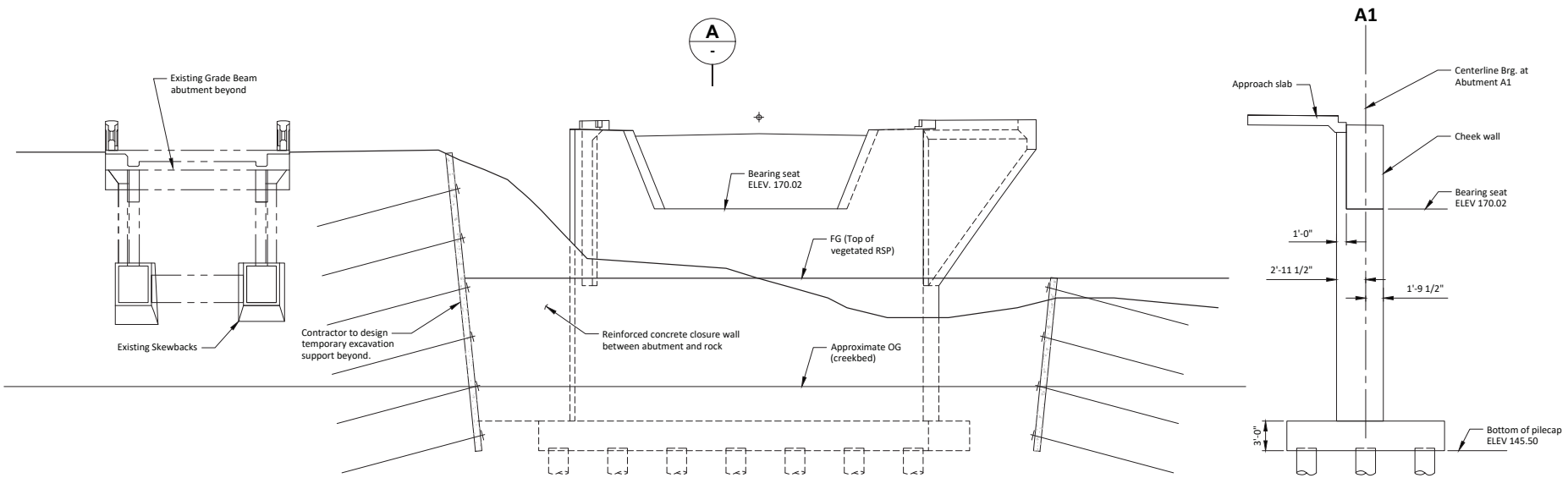
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

FOUNDATION PLAN 2

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	20
TOTAL SHEETS	52

FILENAME: CH-S05.DWG 6/3/2021 2:57 PM



ABUTMENT 1 NORTH ELEVATION

Scale: 3/16" = 1'-0"

SECTION A - A

Scale: 3/16" = 1'-0"

S06

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROUILLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
–	–	–	–
–	–	–	–
–	–	–	–

OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
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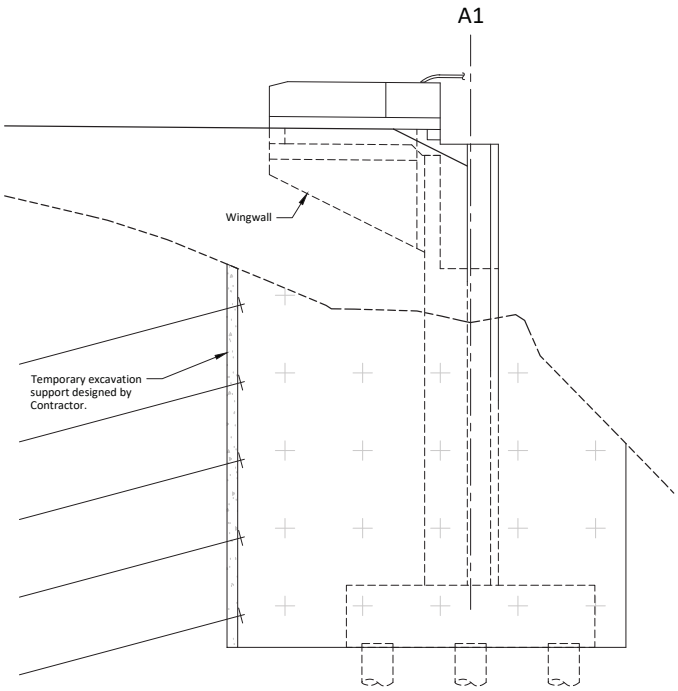
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

ABUTMENT 1 GEOMETRY 1

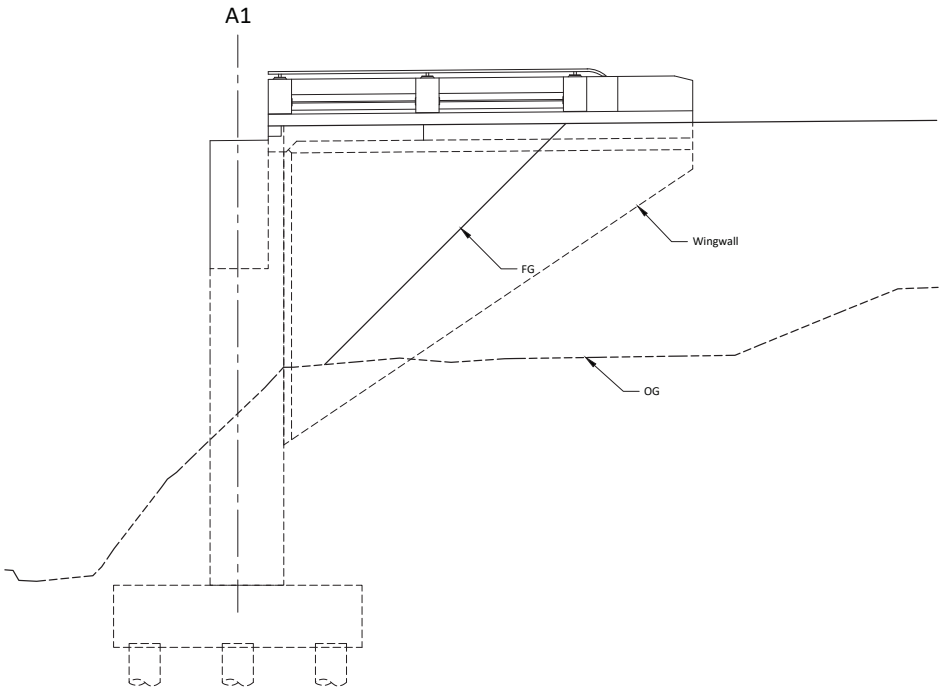
CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	20
TOTAL SHEETS	52

FILENAME: CH-S06.DWG 6/3/2021 2:57 PM



ABUTMENT 1 EAST ELEVATION
Scale: 1/4" = 1'-0"



ABUTMENT 1 WEST ELEVATION
Scale: 1/4" = 1'-0"

S07

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

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CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

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DATE	REVISION	BY	APPROVED
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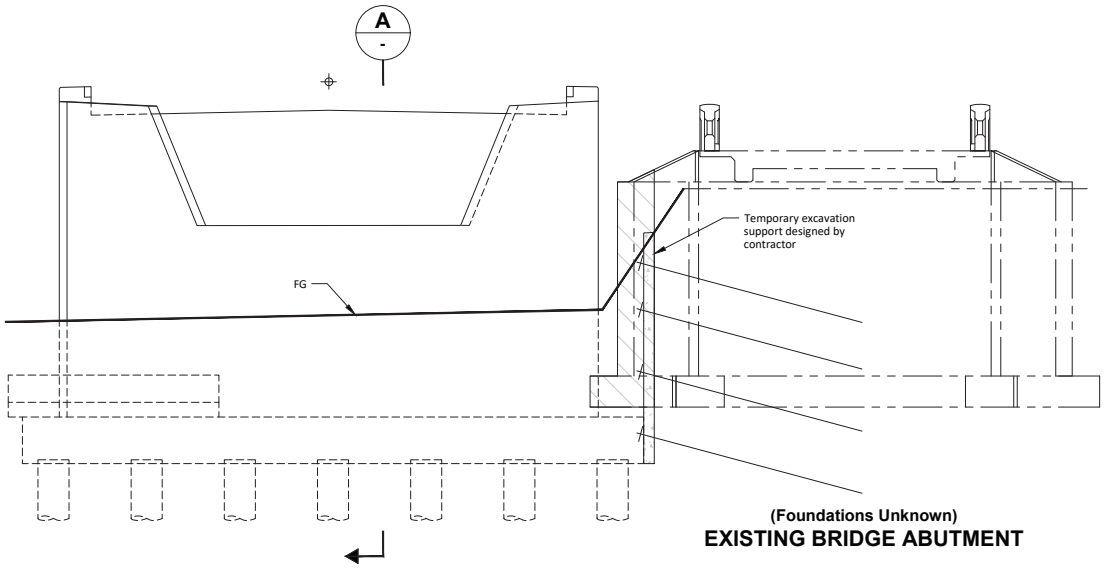
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ABUTMENT 1 GEOMETRY 2

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	21
TOTAL SHEETS	52

FILENAME: CH-S07.DWG 6/3/2021 2:57 PM

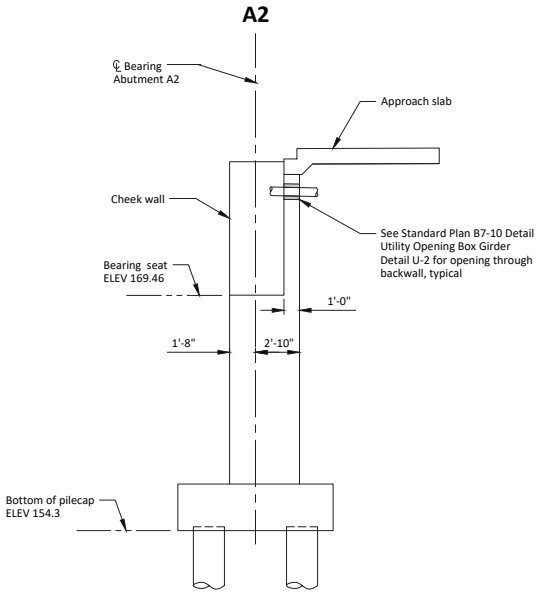


(Foundations Unknown)

EXISTING BRIDGE ABUTMENT

ABUTMENT 2 SOUTH ELEVATION

Scale: 1/4" = 1'-0"



SECTION A -

Scale: 1/4" = 1'-0"

S10

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RESIDENT ENGINEER

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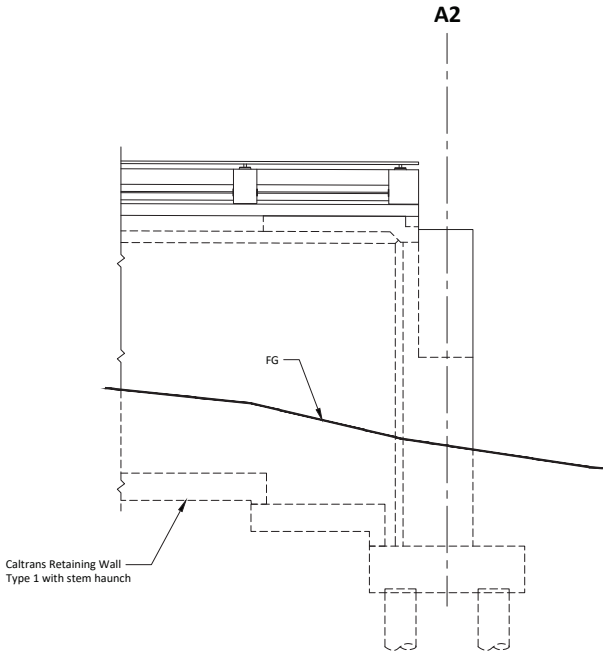
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ABUTMENT 2 GEOMETRY 1

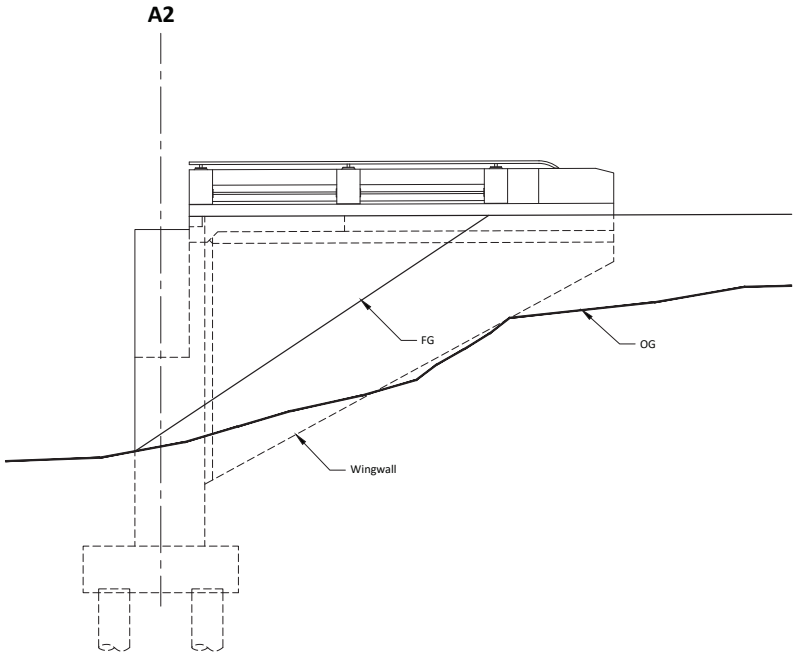
CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	24
TOTAL SHEETS	52

FILENAME: CH-S10.DWG 6/3/2021 2:57 PM



ABUTMENT 2 WEST ELEVATION
Scale: 1/4" = 1'-0"



ABUTMENT 2 EAST ELEVATION
Scale: 1/4" = 1'-0"

FILENAME: CH-S11.DWG 6/3/2021 2:57 PM

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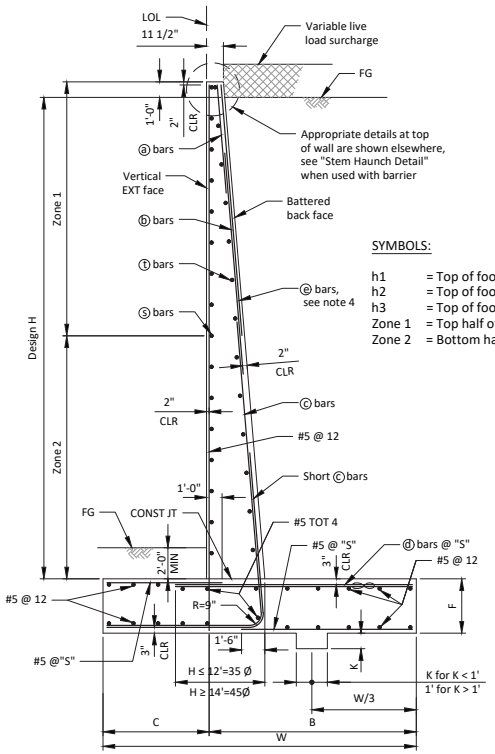
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ABUTMENT 2 GEOMETRY 2

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	25
TOTAL SHEETS	52

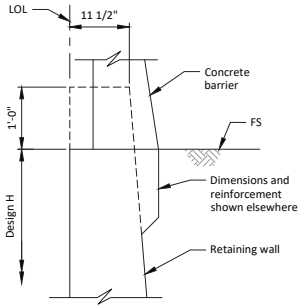


TYPICAL SECTION

Scale: NTS

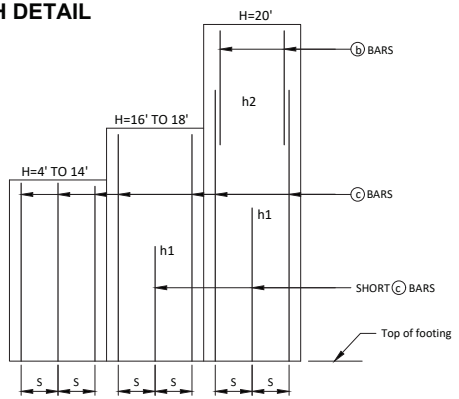
SYMBOLS:

h1	= Top of footing to top of short Ⓒ bar
h2	= Top of footing to top of Ⓒ bar
h3	= Top of footing to top of Ⓑ bar
Zone 1	= Top half of stem height
Zone 2	= Bottom half of stem height



STEM HAUNCH DETAIL

Scale: NTS



ELEVATION

Scale: NTS

DESIGN CONDITIONS:

Design H may be exceeded by 6" before going to the next size.

DESIGN NOTES:

DESIGN:	AASHTO LRFD Bridge Design Specifications, 8th Edition with California Amendments
LS:	Varied surcharge on level ground surface
DC:	Stem Architectural Treatment of thickness up to 2" of concrete (25 psf) considered
CT:	54 kip transverse force applied at He = 32", distributed over 10 feet at the top of wall and 1 : 1 distribution down and outward. Distribution below footing taken no less than 40'
SEISMIC:	kn = 0.3, kv = 0.0
SOIL	Ø = 35°, ϒ = 130 pcf
REINFORCED CONCRETE:	f'c = 4,000 psi fy = 60,000 psi

NOTES:

1. For details not shown and drainage notes see B3-5 / -
2. For wall stem joint details see B0-3 / 3-3 & B0-3 / 3-4
3. At Ⓒ bars:
   H ≤ 6', no splices are allowed within 1'-8" above the top of footing.
   H > 6', no splices are allowed within H/4 above the top of footing.
4. Provide #6 @ 10" x 16'-0" Ⓔ bars over a distance of 8'-0" measured from all expansion joints, begin wall and end wall locations. For H ≤ 14', hook Ⓔ bar into footing and reduce bar length as needed to maintain MIN CLR cover.

TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA

DESIGN H	4'	6'	8'	10'	12'	14'	16'	18'	20'
W	6'-10"	7'-0"	7'-3"	7'-7"	8'-4"	9'-7"	10'-9"	13'-0"	14'-6"
C	2'-2"	2'-3"	2'-3"	2'-4"	2'-6"	3'-0"	3'-6"	4'-3"	6'-3"
B	4'-8"	4'-9"	5'-0"	5'-3"	5'-10"	6'-7"	7'-3"	8'-9"	8'-3"
F	1'-4"	1'-4"	1'-4"	1'-4"	1'-6"	1'-8"	1'-8"	1'-9"	1'-10"
K	8"	8"	8"	8"	1'-0"	1'-4"	1'-8"	2'-0"	3'-0"
BATTER	1/2 : 12	1/2 : 12	1/2 : 12	1/2 : 12	1/2 : 12	1/2 : 12	1/2 : 12	1/2 : 12	1/2 : 12
SPACING "S"	9"	9"	9"	9"	9"	8"	5"	7"	7"
Ⓐ BARS	-	-	-	-	-	-	-	-	-
Ⓑ BARS	-	-	-	-	-	-	-	-	#7
Ⓒ BARS	#6	#6	#6	#6	#7	#7	#7	#9	#10
Ⓓ BARS	#5	#5	#6	#6	#6	#6	#7	#8	#8
h1	-	-	-	-	-	-	5'-9"	5'-10"	8'-0"
h2	-	-	-	-	-	-	-	-	10'-5"
h3	-	-	-	-	-	-	-	-	-
ZONE 1 Ⓢ BARS	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18
ZONE 2 Ⓢ BARS	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 18	#5 @ 12	#5 @ 12	#5 @ 12
ZONE 1 Ⓣ BARS	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18
ZONE 2 Ⓣ BARS	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18	#4 @ 18

FILENAME: CH-S14.DWG 6/3/2021 2:57 PM

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CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

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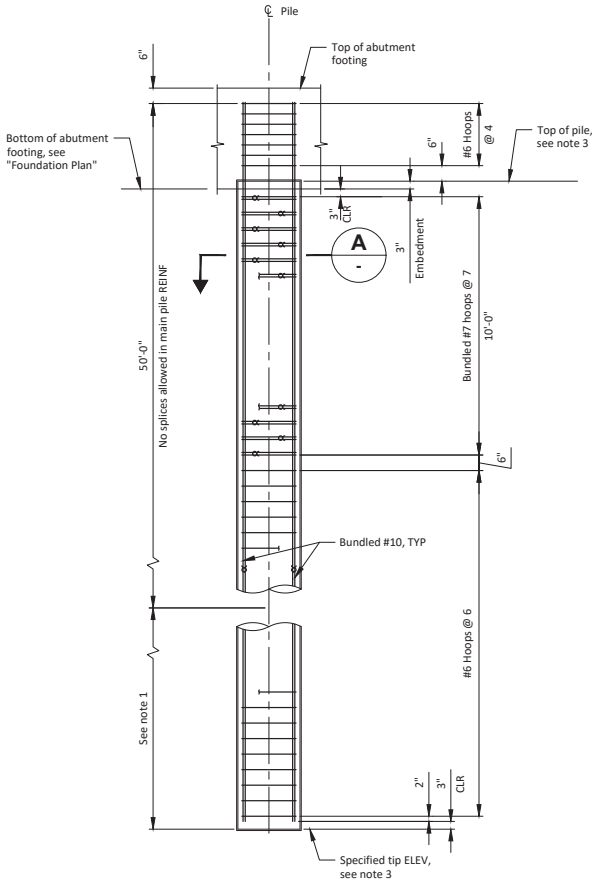
RETAINING WALL SECTIONS

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	28
TOTAL SHEETS	52

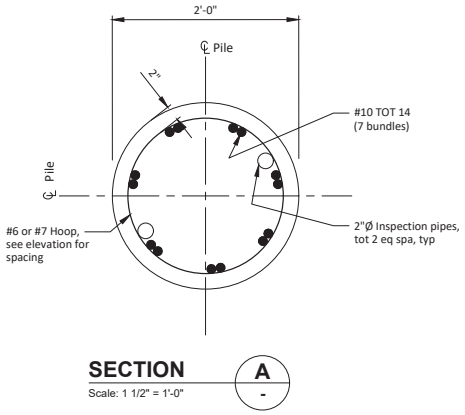
NOTES:

1. Lap splices shall be staggered withing this zone.
2. Main pile reinforcement may be adjusted to accomodate inspection pipes as approved by the engineer.
3. For top of pile and specified tip elevations pile, see "Foundation Plan".
4. All hoops shall be "Ultimate" butt spliced continuous.



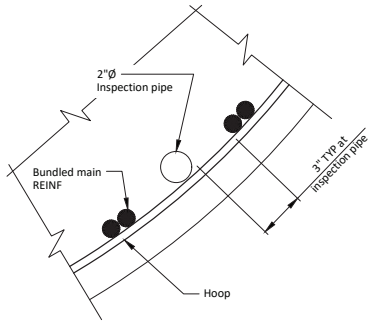
ELEVATION - PILE

Scale: 1/2" = 1'-0"



SECTION A

Scale: 1 1/2" = 1'-0"



INSPECTION PIPE PLACING PLAN

Scale: 3" = 1'-0"

S16

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CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

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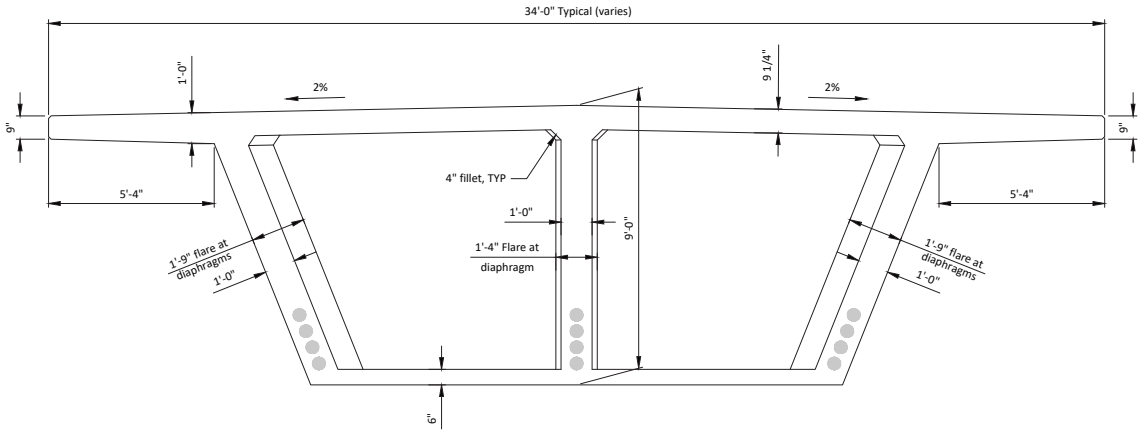
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PILE DETAILS

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

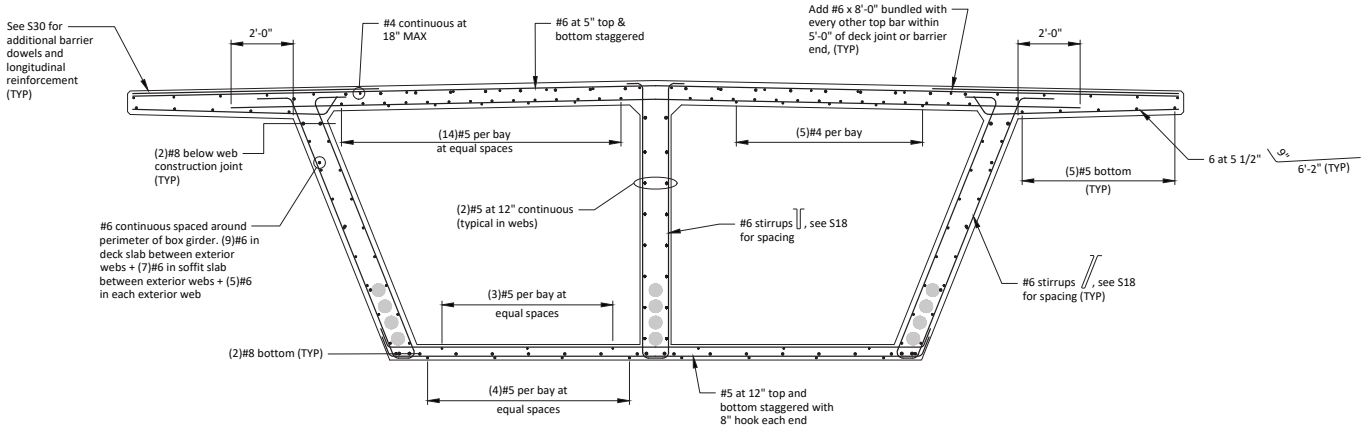
ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	30
TOTAL SHEETS	52

FILENAME: CH-S16.DWG 6/3/2021 2:57 PM



TYPICAL SECTION - GEOMETRY

Scale: 1/2" = 1'-0"



TYPICAL SECTION - REINFORCING

Scale: 1/2" = 1'-0"

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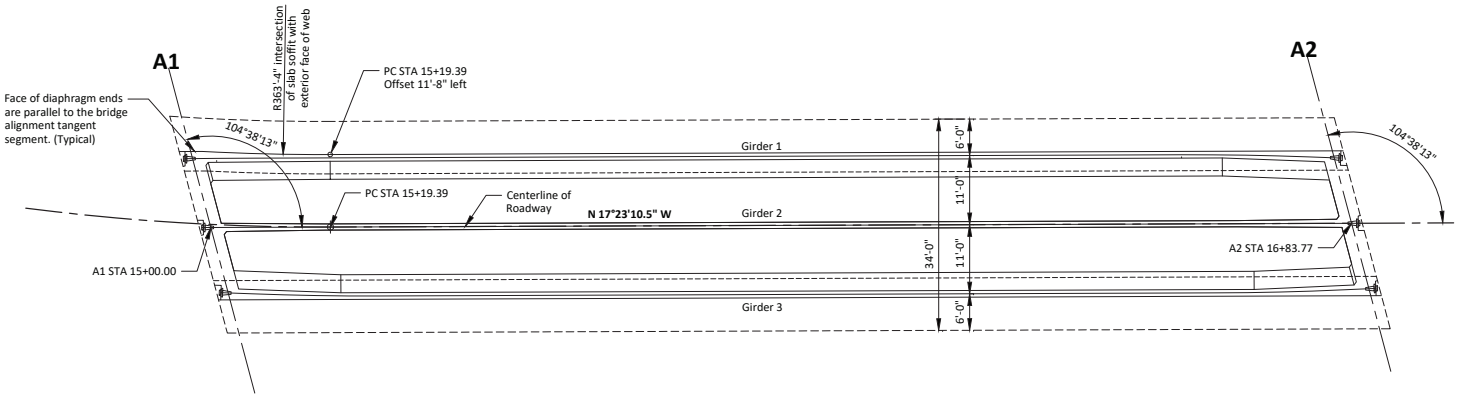
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BOX GIRDER TYPICAL SECTION

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

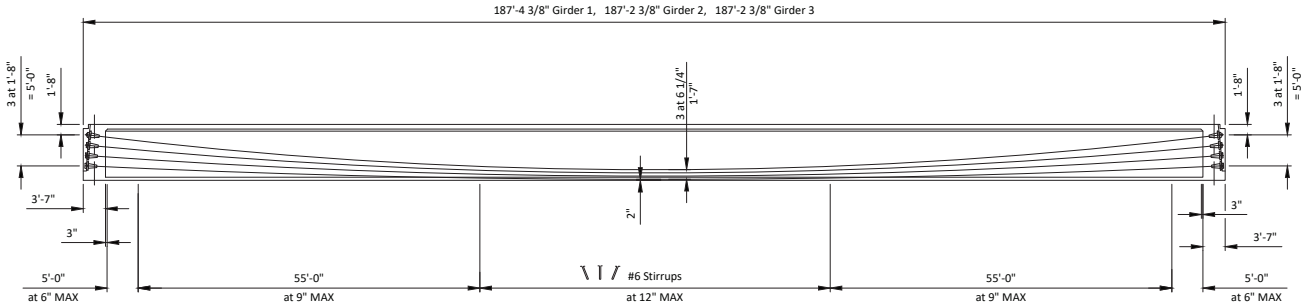
ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	31
TOTAL SHEETS	52

FILENAME: CH-S17.DWG 6/3/2021 2:58 PM



GIRDER LAYOUT

Scale: 1" = 10'



GIRDER LONGITUDINAL SECTION

Scale: 1" = 10'

S18

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GIRDER LAYOUT

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	32
TOTAL SHEETS	52

FILENAME: CH-S18.DWG 6/3/2021 2:58 PM

PRESTRESSING NOTES:

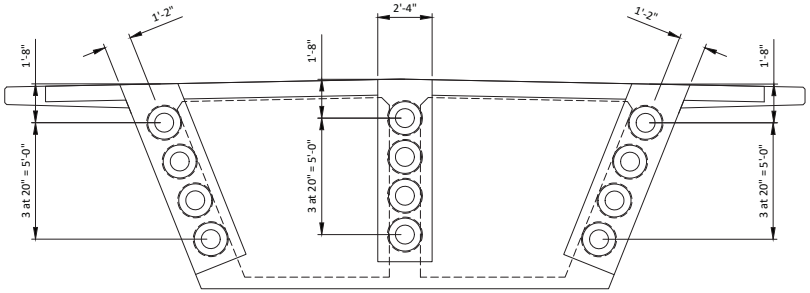
270 ksi Low Relaxation Strand:

Pjack	= 4,746 (kips per girder)
Anchor set	= 3/8 (in)
Friction curvature coeffiecient, μ	= 0.15 (1/rad)
Friction wobble coefficient, k	= 0.0002 (1/ft)
Total Number of Girders	= 3

Concrete:

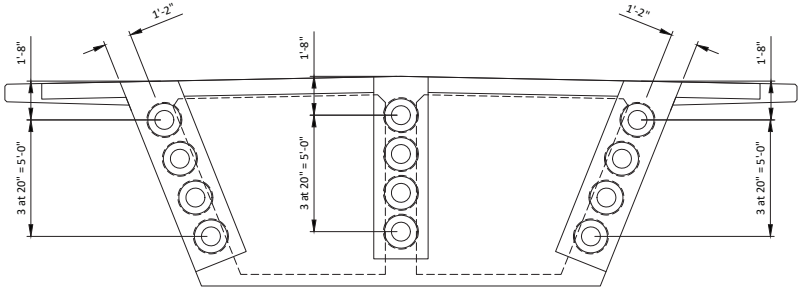
f'c = 6,000 psi @ 28 days
f'ci = 4,500 psi @ time of stressing

One end stressing shall be performed from Abutment 1 end only.



VIEW - PT ANCHORAGES AT ABUTMENT 1

Scale: 3/8" = 1'-0"



VIEW - PT ANCHORAGES AT ABUTMENT 2

Scale: 3/8" = 1'-0"

FILENAME: CH-S19.DWG 6/3/2021 2:58 PM

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RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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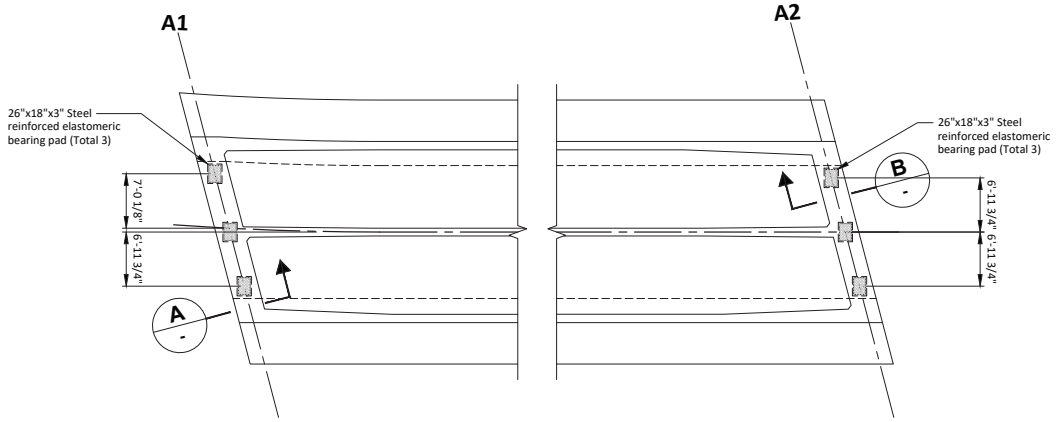
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PT ANCHORAGE AT ABUTMENTS

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	33
TOTAL SHEETS	52

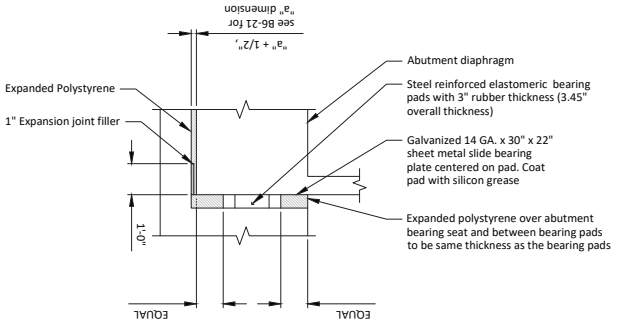


BEARING AT ABUTMENT 1

Scale: 1/8" = 1'-0"

BEARING AT ABUTMENT 2

Scale: 1/8" = 1'-0"



BEARING PLACEMENT DETAIL

Scale: 1/2" = 1'-0"

Similar and OPP Hand

A - B -

NOTES:

1. Bearing pads shall be set level.
2. The elastomeric compound shall be neoprene and conform to Caltrans specifications.
3. All edge of the bearing steel plates shall be ground or otherwise treated so that no sharp edges remain.

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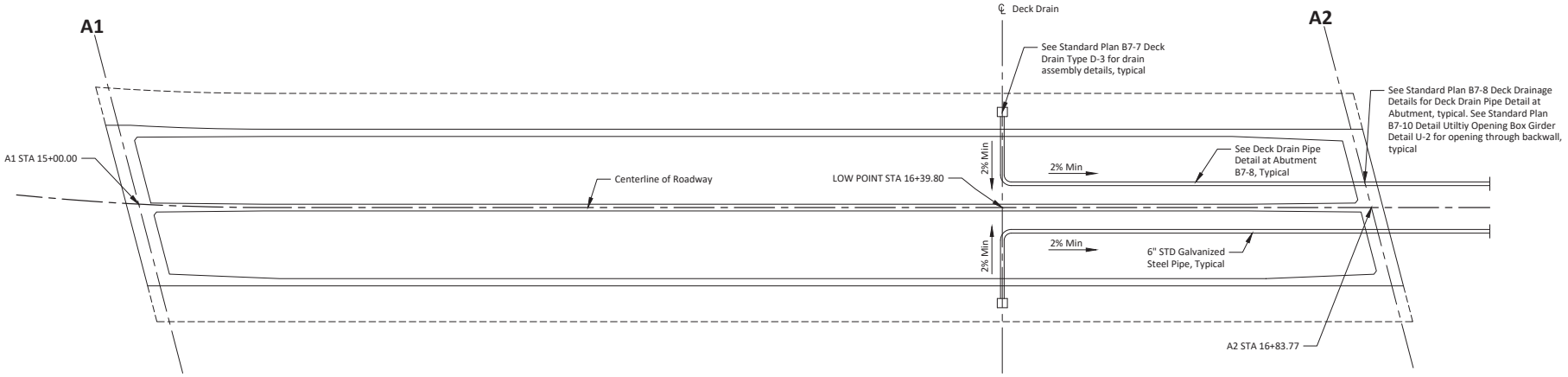
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BEARING LAYOUTS AND DETAILS

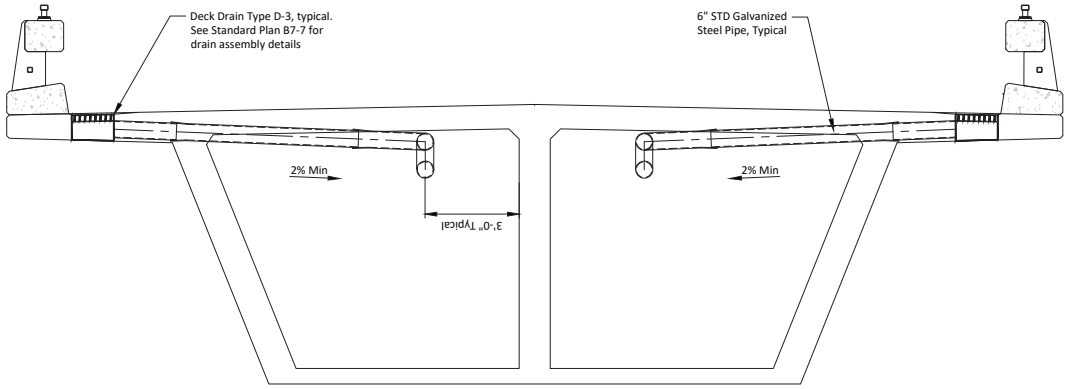
CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	39
TOTAL SHEETS	52

FILENAME: CH-S25.DWG 6/3/2021 2:58 PM



PLAN
Scale: 1/8" = 1'-0"



DECK DRAIN SECTION
Scale: 1/2" = 1'-0"

S26

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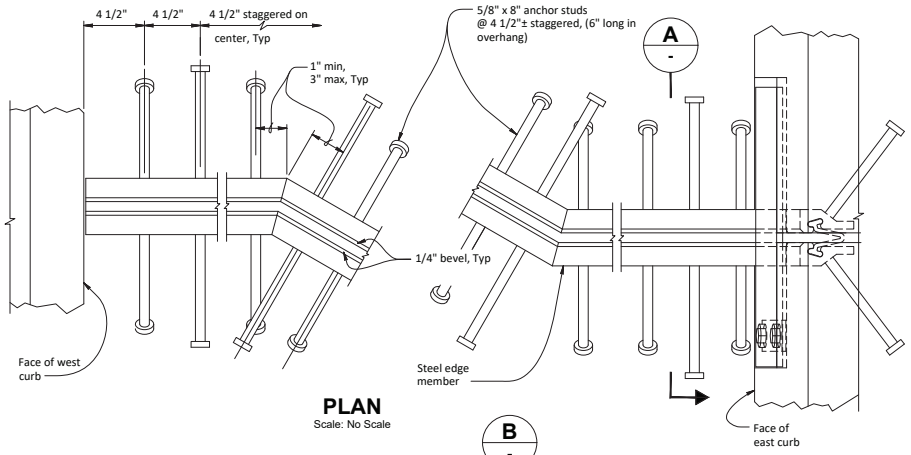
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

DECK DRAINS

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

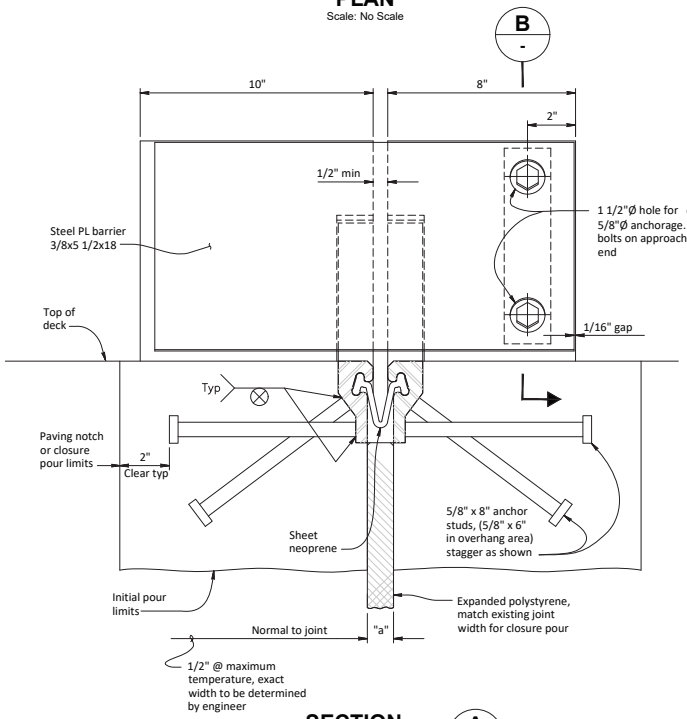
ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	40
TOTAL SHEETS	52

FILENAME: CH–S26.DWG 6/3/2021 2:58 PM



PLAN

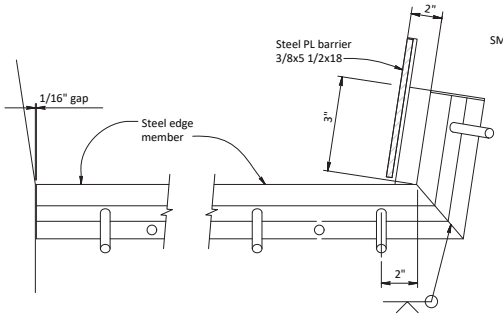
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SECTION

Scale: No Scale

A
-

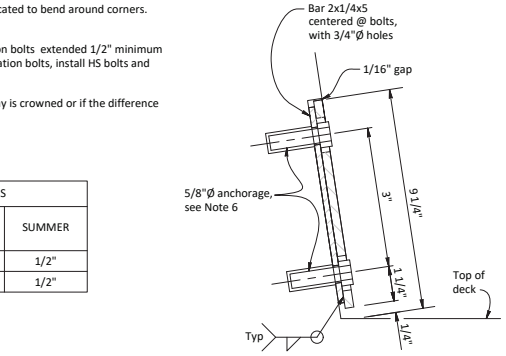


BARRIER DETAIL HIGH SIDE

Scale: No Scale

BARRIER DETAIL LOW SIDE

Scale: No Scale



SECTION

Scale: No Scale

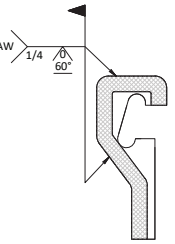
B
-

SCHEMATIC STEEL EDGE MEMBER

NOTES:

1. Alternatively, fillet or complete penetration welds may be used at anchor studs.
2. Alternate types of anchor studs may be permitted subject to the authorization by the Engineer.
3. Joint seal assembly to be used in conjunction with closure pour. (See other sheets for limits). Closure pour shall not be placed until final deck surface is within the tolerances specified.
4. Use joint at crown of roadway, at any change in traverse slope in deck and at changes in horizontal direction. Place other joints at or near lanes. All metal parts to be painted or galvanized after fabrication.
5. Sheet Neoprene shall be fabricated in one continuous piece and shall be fabricated to bend around corners. Field splices of the neoprene are not allowed.
6. Insert assembly or expansion anchorage for 5/8" x 1 3/4" bolts. Use installation bolts extended 1/2" minimum past nut and coat with bond breaker, after concrete has cured, remove installation bolts, install HS bolts and sheet neoprene.
7. Sidewalk Detail similar to Barrier Detail on low side at both sides if the roadway is crowned or if the difference in elevation between the ends of the seal is 0.5' or less.
8. Anchor studs shall conform to ASTM 108.

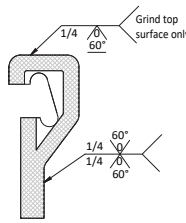
JOINT INFORMATION			"a" DIMENSIONS		
LOCATION	MOVEMENT RATING (MR)	SKEW	WINTER	SPRING & FALL	SUMMER
A1	2"	17°	1 1/4"	1"	1/2"
A2	2"	10°	1 1/4"	1"	1/2"



SCHEMATIC FIELD WELD DETAIL

Scale: No Scale

NOTE:
Shaded areas to be welded



SCHEMATIC SHOP WELD DETAIL

Scale: No Scale

S27

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DRAWING BY	–
CHECKED BY	–

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REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROULLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
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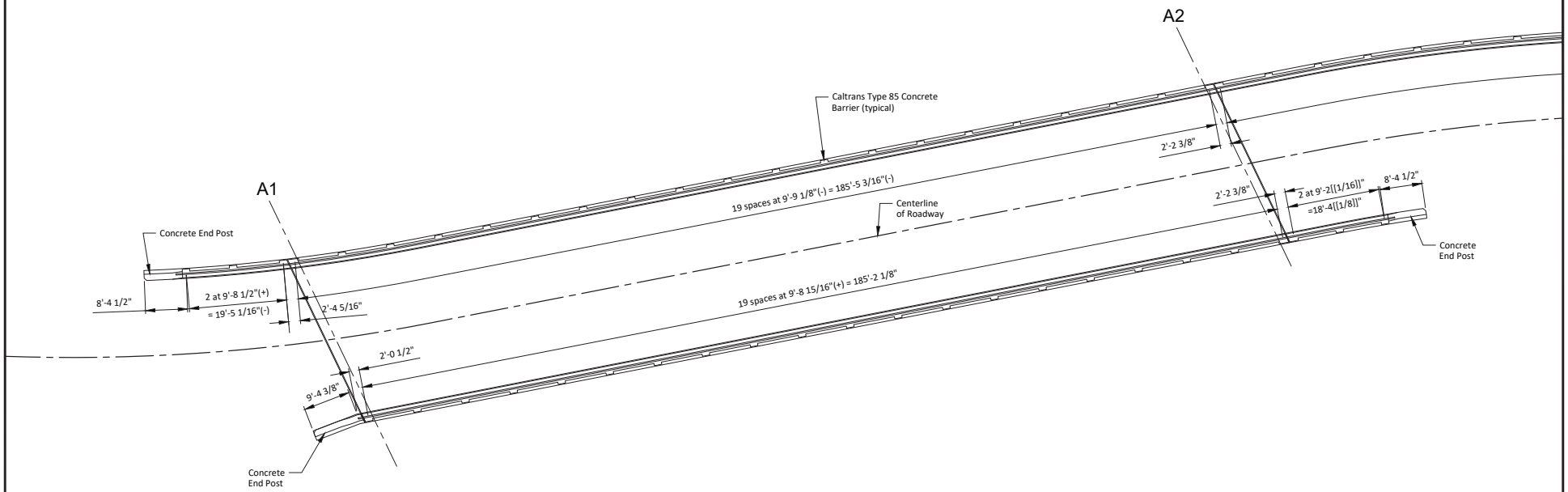
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

DECK JOINT DETAILS

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	41
TOTAL SHEETS	52

FILENAME: CH-S27.DWG 6/3/2021 2:58 PM



NOTES:

1. Longitudinal dimensions measured along post centerline.
2. Don't apply textured surfaces within 2'-9" of concrete end post end.

RAIL POST AND END POST LAYOUT - 1

Scale: 1" = 1'-10'

S28

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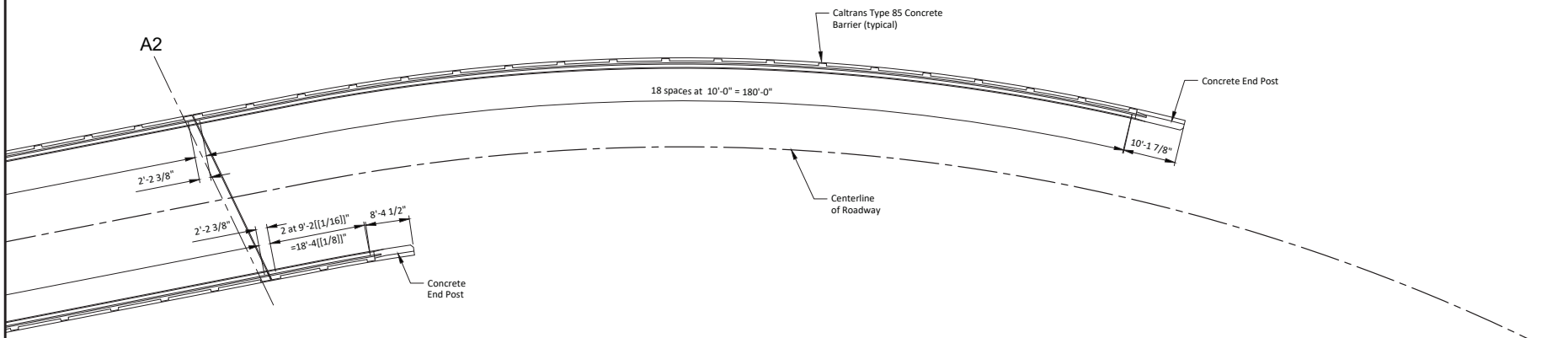
COUNTY OF SONOMA
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JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

CONCRETE BARRIER LAYOUT – 1

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	42
TOTAL SHEETS	52

FILENAME: CH-S28.DWG 6/3/2021 2:58 PM



NOTES:

1. Longitudinal dimensions measured along post centerline.
2. Don't apply textured surfaces within 2'-9" of concrete end post end.

RAIL POST AND END POST LAYOUT - 2

Scale: 1" = 1'-10'

S29

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

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CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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315 Bay Street, San Francisco, CA 94133
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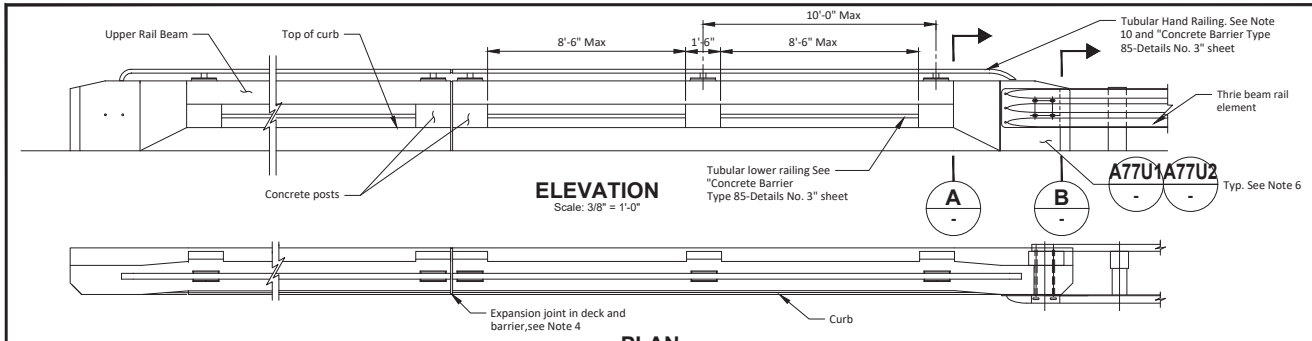
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

CONCRETE BARRIER LAYOUT – 2

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

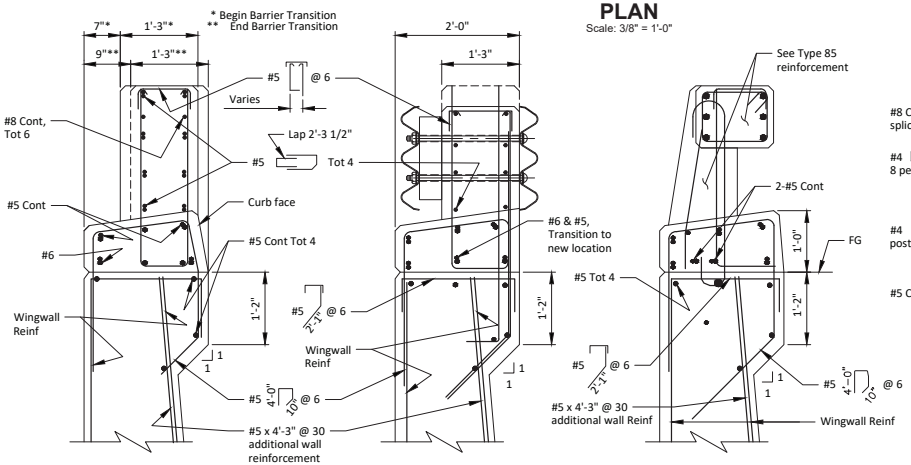
ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	43
TOTAL SHEETS	52

FILENAME: CH-S29.DWG 6/3/2021 2:59 PM



ELEVATION
Scale: 3/8" = 1'-0"

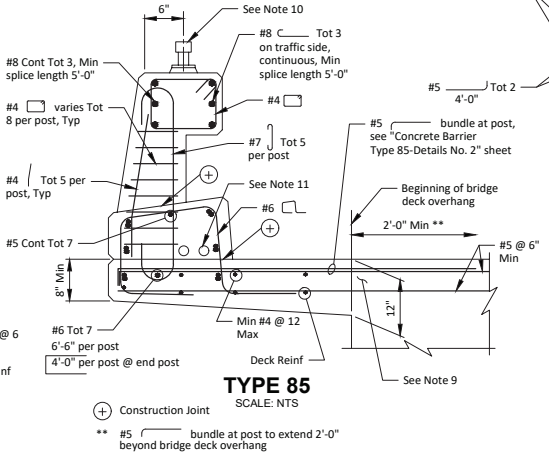
PLAN
Scale: 3/8" = 1'-0"



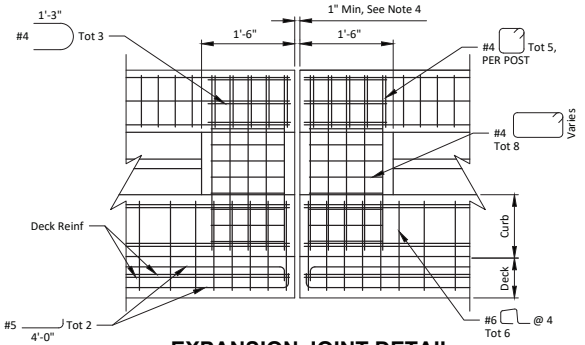
SECTION A
Scale: NTS
S40

SECTION B
Scale: NTS
S40

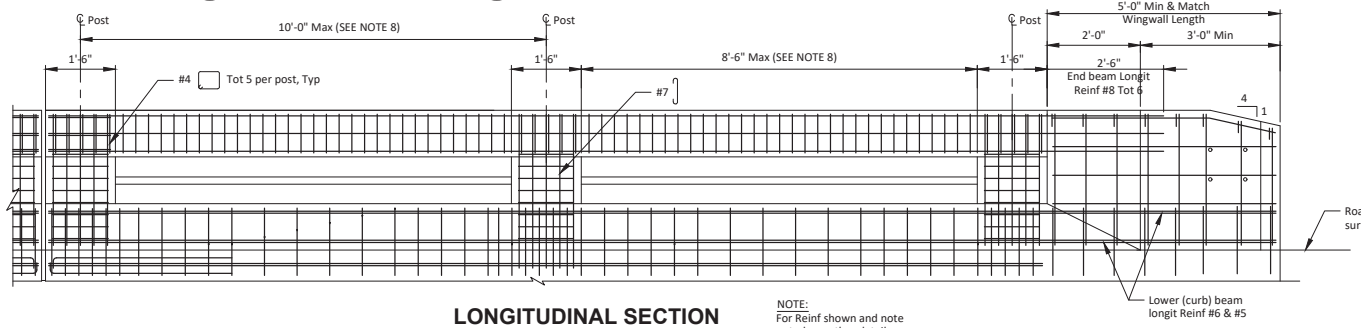
TYPE 85A
SCALE: NTS



TYPE 85
SCALE: NTS



EXPANSION JOINT DETAIL
SCALE: 1" = 1'-0"



LONGITUDINAL SECTION
Scale: NTS

NOTE:
For Reinf shown and note noted see other details.

NOTES:

1. Walls are to be backfilled before the barrier is placed.
2. Longitudinal reinforcing steel to stop at all expansion joints.
3. The front face dimensions are to be constant above the finish roadway profile, but the overall height will vary with certain thickness of surfacing and roadway slopes.
4. Expansion joint to match deck joint.
5. Splicing in longitudinal rail reinforcing must be staggered.
6. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
7. Chain link railing is not allowed on Type 85 Barriers.
8. Posts to be spaced equally, typically 10'-0" spacing. Post spacing may be reduced where location of expansion joints or the length of wingwalls will not accommodate the 10'-0" spacing. Maximum see-through availability is to be strived for, where 10'-0" post spacing can not be achieved.
9. For additional reinforcement details, see "CONCRETE BARRIER TYPE 85-DETAILS No. 2" sheet.
10. Tubular railing is optional refer to General Plan and Typical Section in Structural Plans.
11. The maximum number of conduits is limited to two 1 1/2"Ø and must be placed in front half of the lower beam/curb.

STANDARD PLAN SHEET NO.
DETAIL NO.

S30

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CONSTRUCTION COMPLETED:
RESIDENT ENGINEER
RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

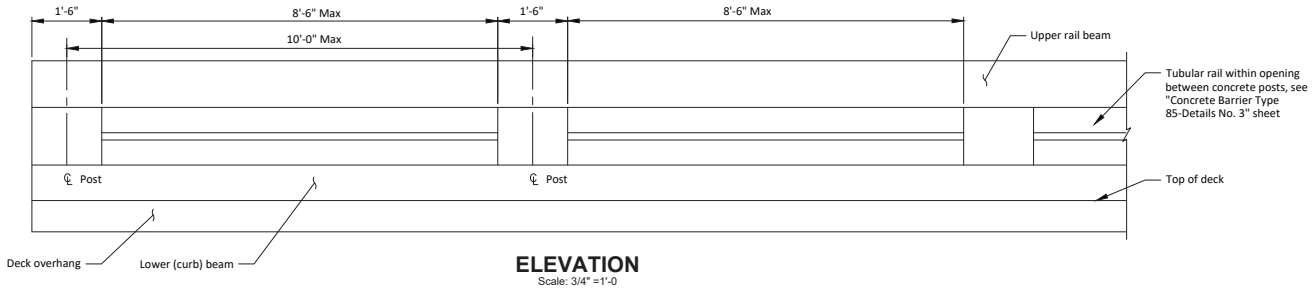
COUNTY OF SONOMA
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CONCRETE BARRIER TYPE 85 – 1

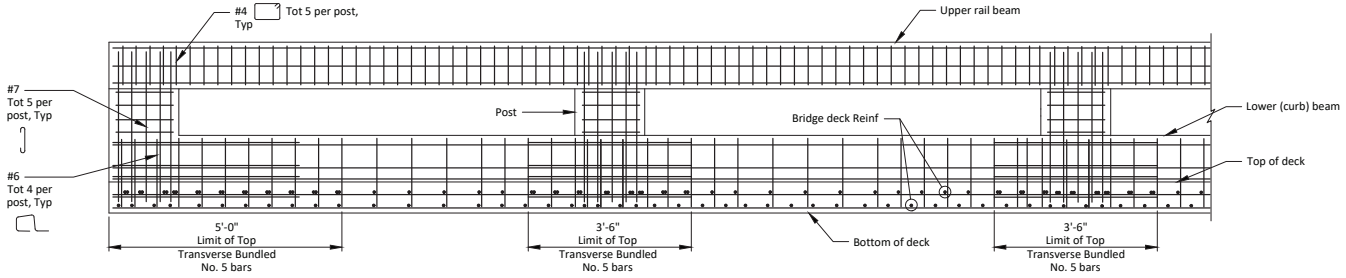
CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	44
TOTAL SHEETS	52

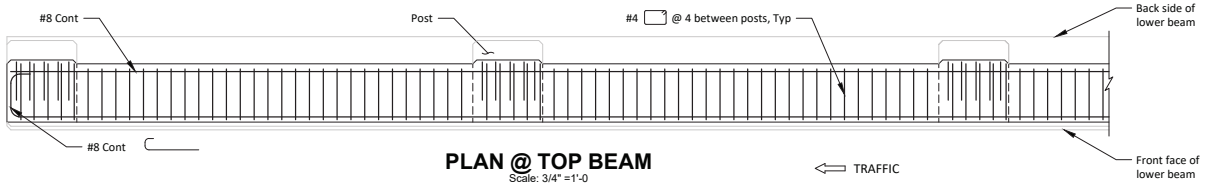
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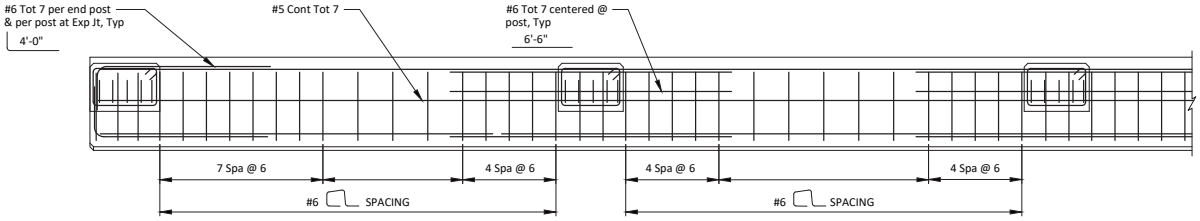
ELEVATION
Scale: 3/4" =1'-0



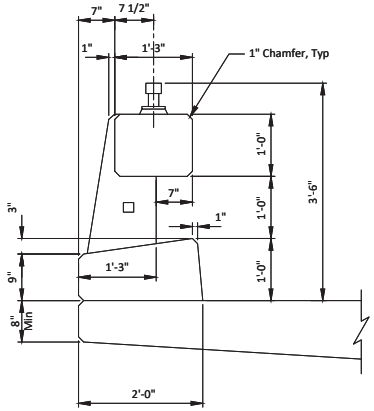
ELEVATION
Scale: 3/4" =1'-0



PLAN @ TOP BEAM
Scale: 3/4" =1'-0



PLAN @ BOTTOM (CURB) BEAM
Scale: 3/4" =1'-0



TYPICAL SECTION
Scale: 1" =1'-0

*** Dimension may vary with bridge cross-slop and with certain thickness of surfacing. See Structural Plans.**

S31

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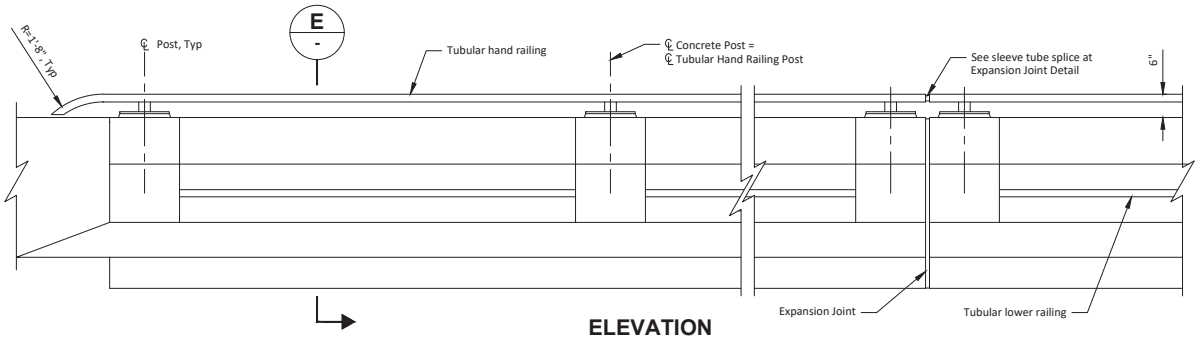
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CONCRETE BARRIER TYPE 85 – 2

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	45
TOTAL SHEETS	52

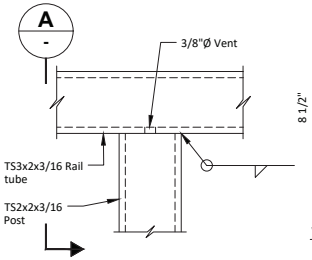
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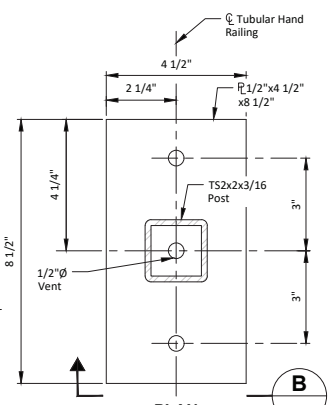
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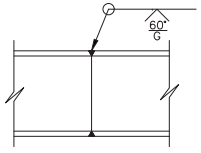
1. Tubular hand railing posts shall be normal to railing.
2. Tube splices shall be located in the tubes spanning deck or wall joints. Increase joint width in tubes to match expansion joint width and increase sleeve length accordingly.
3. Top rail tube shall be continuous over not less than two posts.
4. 3/8" nut tack welded to sleeve may be replaced by drilled and tapped hole in sleeve.



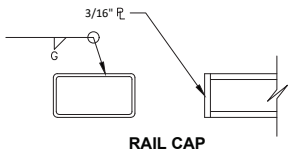
ELEVATION



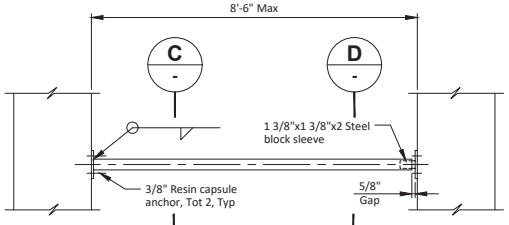
PLAN



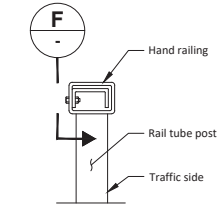
TUBE-WELDED SPLICE



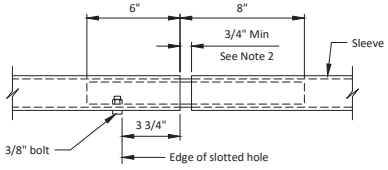
RAIL CAP



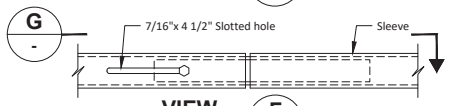
LOWER RAIL DETAIL



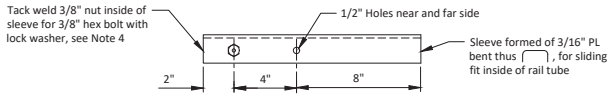
SECTION F -



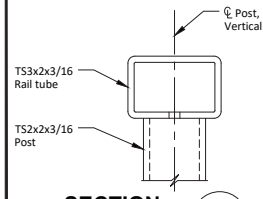
VIEW G -



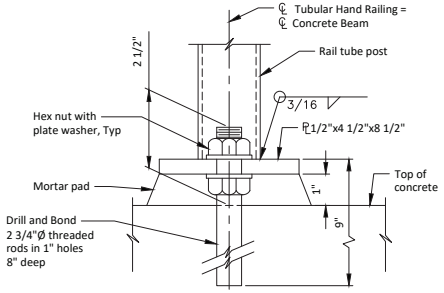
VIEW F -



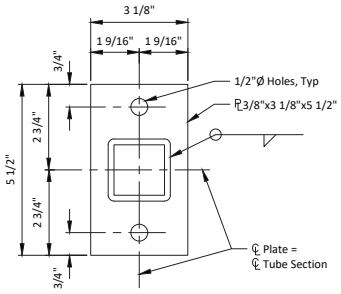
SLEEVE TUBE SPLICE AT EXPANSION JOINT DETAIL
Scale: NTS



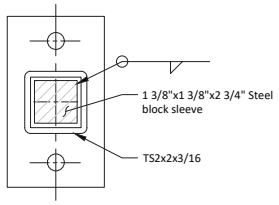
SECTION A -



ELEVATION
SECTION B -

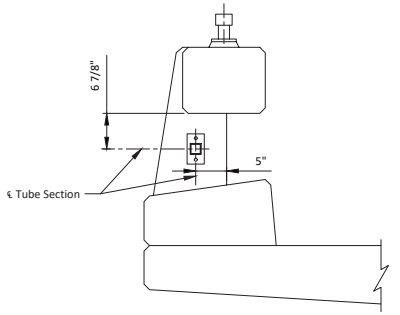


SECTION C -



SECTION D -

See Section C for details not shown



SECTION E -
Scale: NTS

TUBULAR RAILING DETAILS
Scale: NTS

S32

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DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

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RESIDENT ENGINEER

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315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

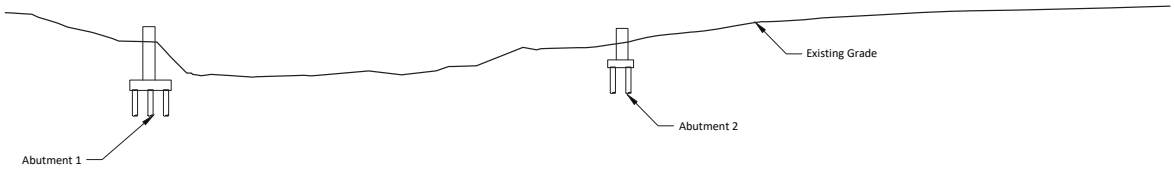
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

CONCRETE BARRIER TYPE 85 – 3

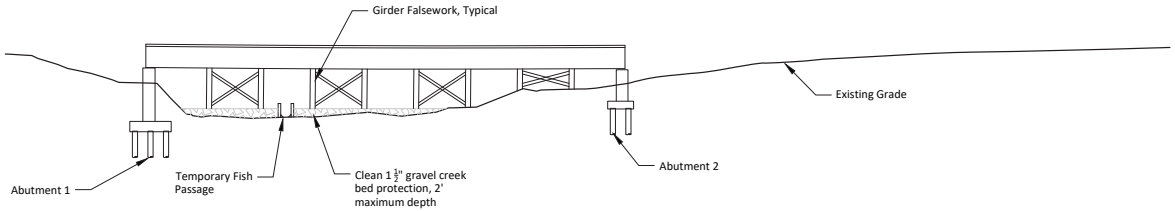
CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	46
TOTAL SHEETS	52

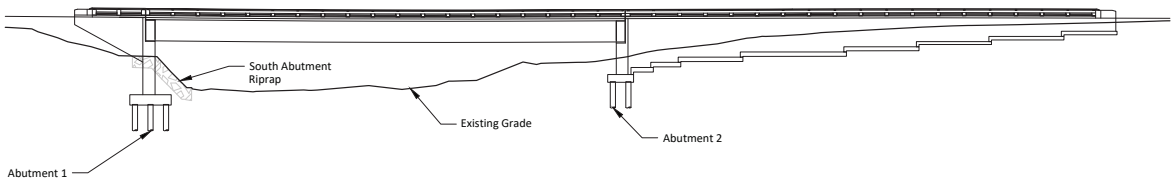
FILENAME: CH-S32.DWG 6/3/2021 2:59 PM



SEASON 1 - PHASE 1
Scale: 1/2" = 1'-0"



SEASON 1 - PHASE 2
Scale: 1/2" = 1'-0"



SEASON 1 - PHASE 3
Scale: 1/2" = 1'-0"

SEASON 1 - PHASE 1:

1.1 Install temporary traffic control measures.

1.2 Implement storm water pollution protection plan.

1.3 Install excavation supports.

1.4 Install CIDH piles.

1.5 Construct abutments.

SEASON 1 - PHASE 2:

2.1 Develop creek bed access.

2.2 Install creekbed protection and fish passage.

2.3 Erect girder falsework.

2.4 Place stem and soffit reinforcement, and cast stem and soffit concrete.

2.5 Place deck reinforcement and cast deck polyester concrete.

2.6 Stress girders to 100% P_{jack} once concrete has reached adequate strength.

SEASON 1 - PHASE 3:

3.1 Remove girder falsework.

3.2 Construct abutment backwall and wingwalls.

3.3 Construct approach retaining walls, approach embankments and approach slabs.

3.4 Install bridge barriers and guard rails.

3.5 Transfer traffic onto new bridge.

3.6 Remove temporary fish passage and implement stream protections to winterize the project site.

SEASON 2:

Refer to C-2, S35, S39 for construction activities in the second construction year.

FILENAME: CH-S34.DWG 6/3/2021 2:59 PM

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROLLINGER JR. C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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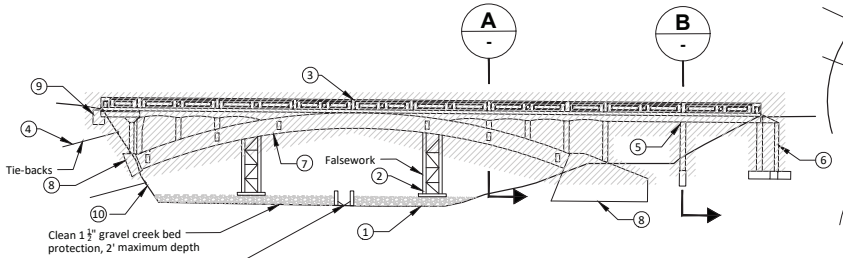
OPAC Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

CONSTRUCTION SEQUENCE

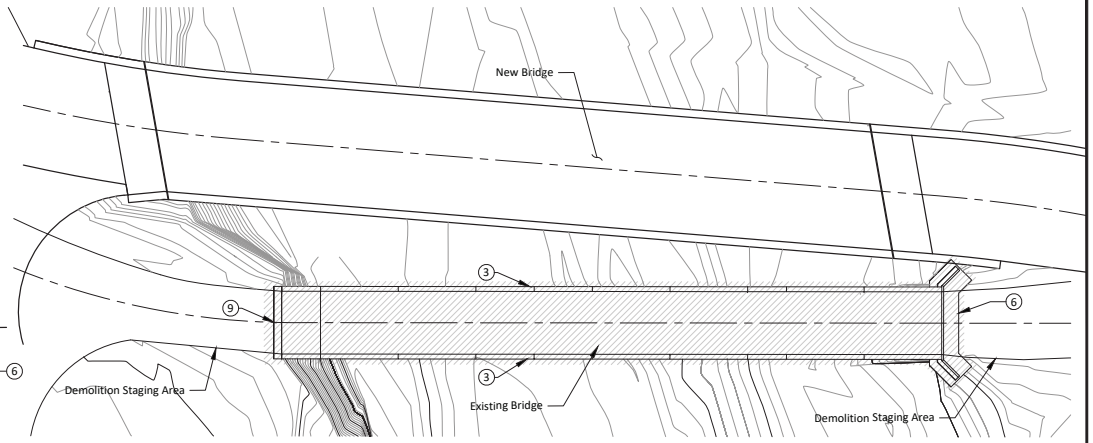
CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021-2022
SHEET NUMBER	48
TOTAL SHEETS	52



EXISITING BRIDGE ELEVATION

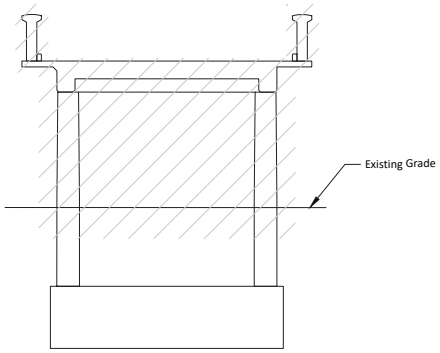
Scale: 1/16" = 1'-0"



EXISITING BRIDGE PLAN

Scale: 1/16" = 1'-0"

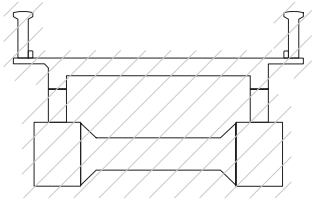
NORTH



APPROACH SECTION

Scale: 1/4" = 1'-0"

B
-



ARCH SECTION

Scale: 1/4" = 1'-0"

A
-

DEMOLITION SEQUENCE:

1. Protect creek bed and install stream channel diversion.
2. Install falsework to support existing arch rib.
3. Demolish bridge barriers and metal beam guardrail.
4. Install tie-backs (See SXX for details).
5. Demolish north approach span.
6. Remove north abutment, wingwalls and pier down to top of their footings.
7. Demolish arch span.
8. Remove arch thrust blocks entirely or maximum 5ft below grade.
9. Remove south abutment and wingwalls to top of their footings.
10. Trim tuff block (See SXX for details).

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROULLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

EXISTING BRIDGE DEMOLITION SEQUENCE

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	49
TOTAL SHEETS	52

FILENAME: CH-S35.DWG 6/3/2021 2:59 PM



SITE PLAN - EXISTING CONDITION

Scale: 1" = 10'

S36

FILENAME: CH-536.DWG 6/3/2021 2:59 PM

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DRAWING BY	–
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DATE

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"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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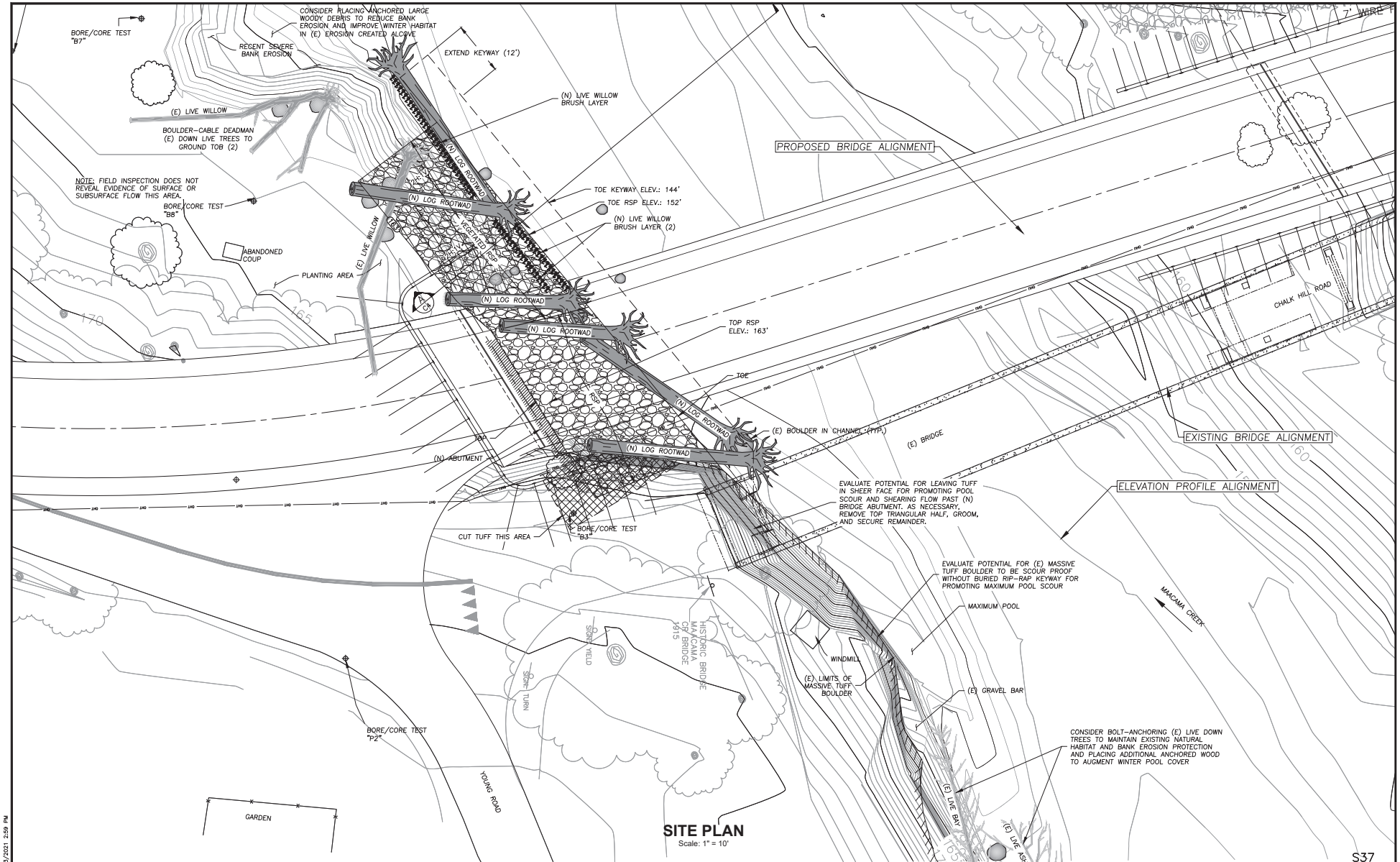
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COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

SOUTH CREEKBANK STABILIZATION 1 OF 3

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021–2022
SHEET NUMBER	50
TOTAL SHEETS	52



SITE PLAN

Scale: 1" = 10'

S37

DESIGN BY	–
DRAWING BY	–
CHECKED BY	–

REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROULLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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OPAC Consulting Engineers
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(415) 989-4551 (415) 989-4135 fax

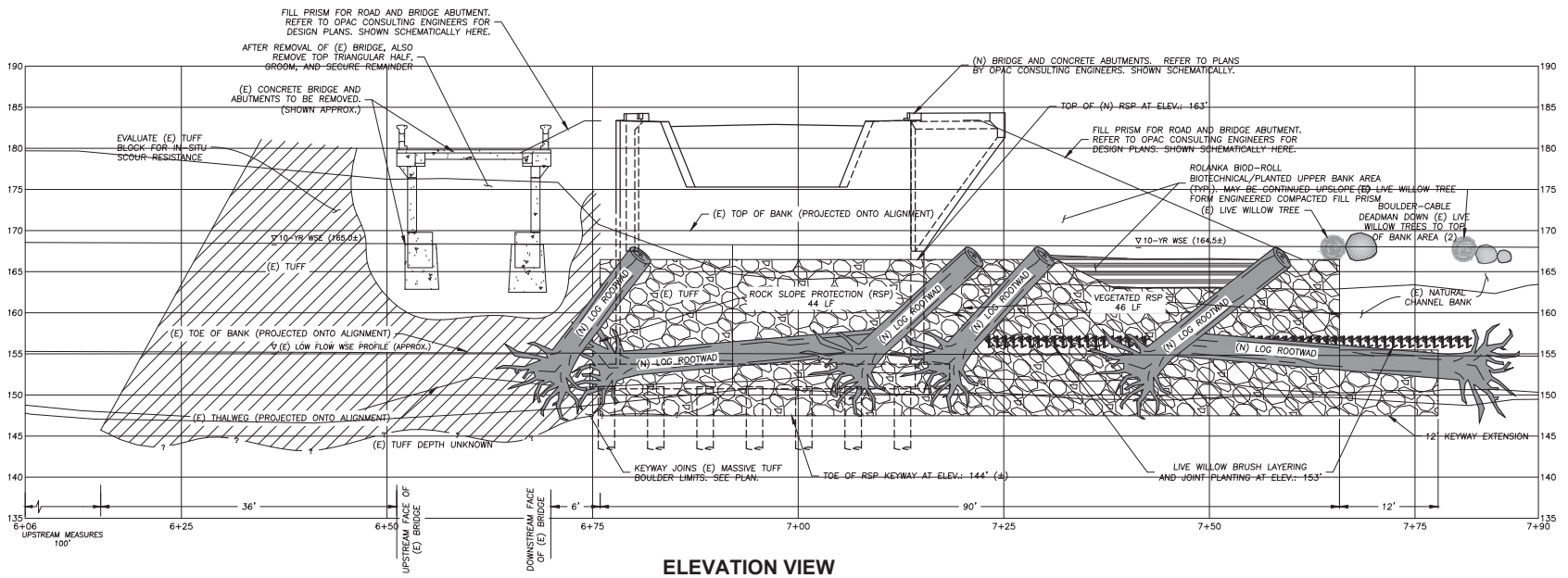
COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES J. HOEVERTSZ, P.E., DIRECTOR

SOUTH CREEKBANK STABILIZATION 2 OF 3

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

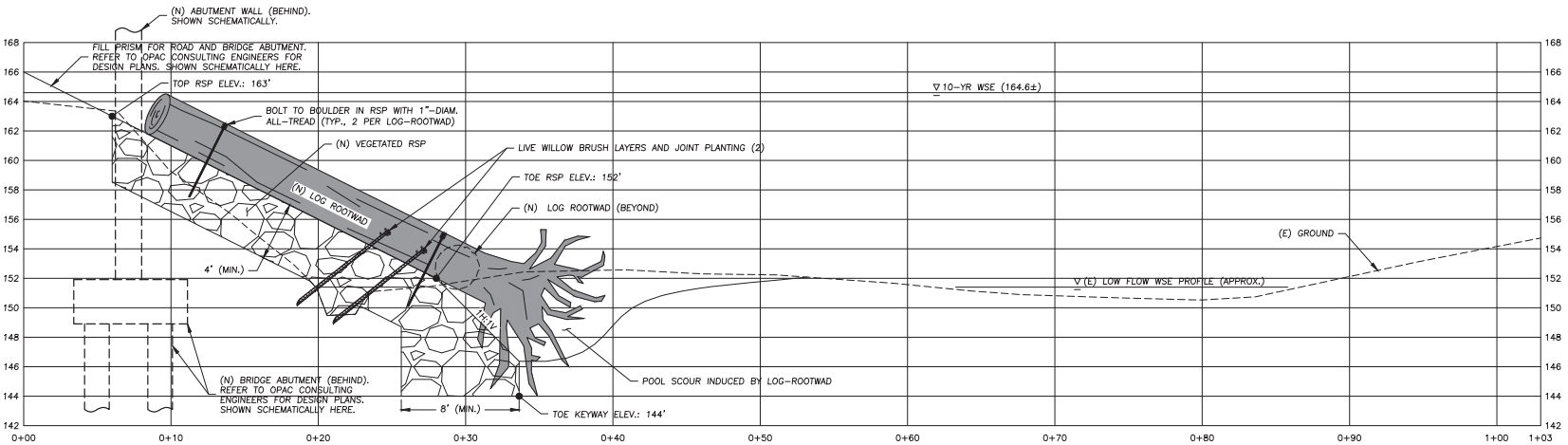
ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021-2022
SHEET NUMBER	51
TOTAL SHEETS	52

FILENAME: CH-537.DWG 6/3/2021 2:59 PM



ELEVATION VIEW

Scale: 1" = 7'



TYPICAL SECTION A

Scale: 1" = 4'

S38

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DRAWING BY	–
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REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER FRANCIS G. DROULLARD C 042040 Exp. 3-31-22 CIVIL STATE OF CALIFORNIA

"RECORD DRAWINGS" INFORMATION TO BE COMPLETED AFTER CONSTRUCTION

CONSTRUCTION COMPLETED:

RESIDENT ENGINEER

RECORD DRAWINGS BY:

DATE	REVISION	BY	APPROVED
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DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
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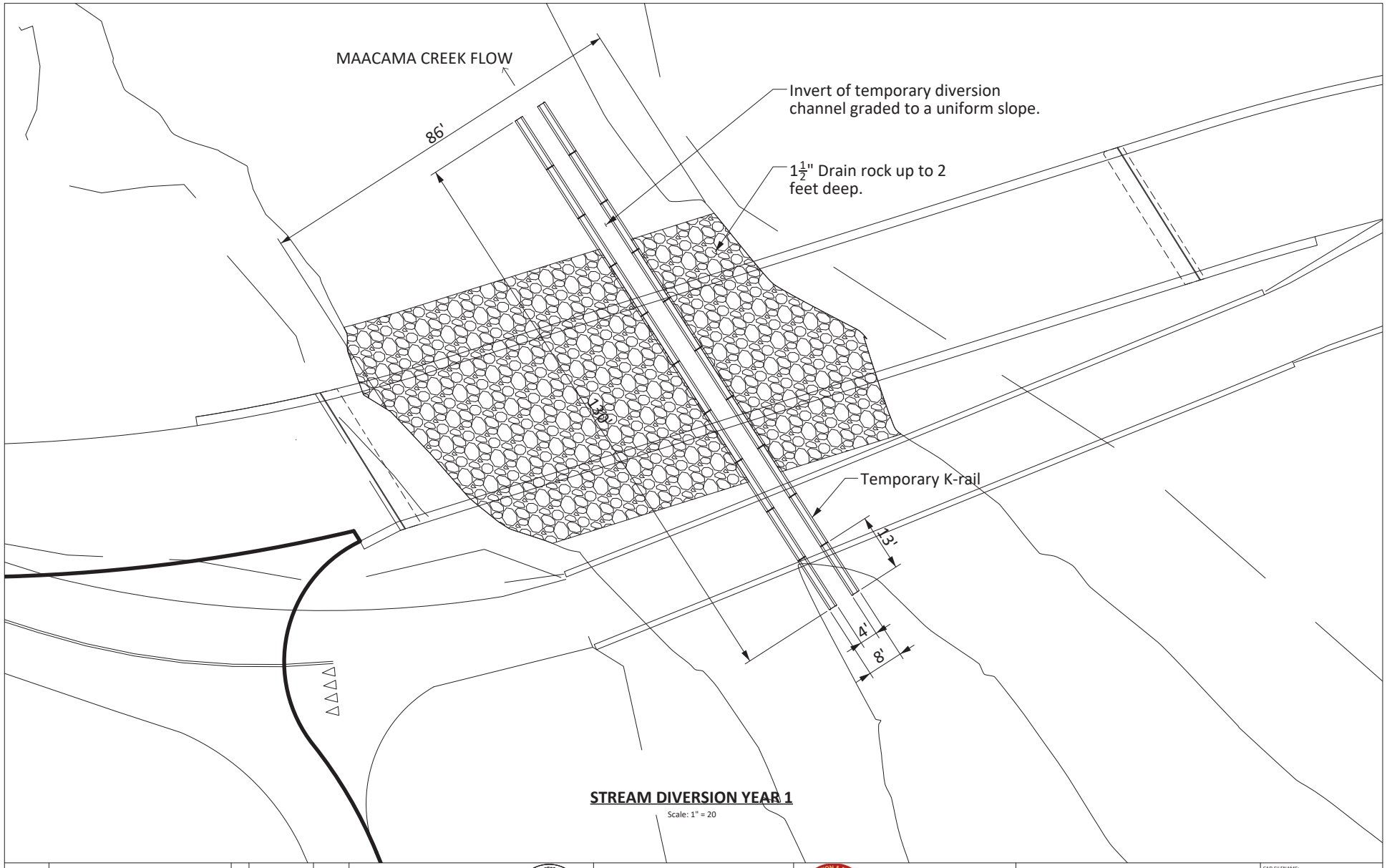
SOUTH CREEKBANK STABILIZATION 3 OF 3

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT

ROAD NUMBER	8806
BUDGET NUMBER	C10002
FISCAL YEAR	2021-2022
SHEET NUMBER	52
TOTAL SHEETS	52

FILENAME: CH-538.DWG 6/3/2021 2:59 PM

Appendix C – Stream Diversion System Diagrams



STREAM DIVERSION YEAR 1

Scale: 1" = 20

DATE	REVISION	BY

DESIGN BY

DRAWING BY

CHECKED BY

REGISTERED CIVIL ENGINEER

XX/XX/2019
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. C 82396 — CIVIL — STATE OF CALIFORNIA

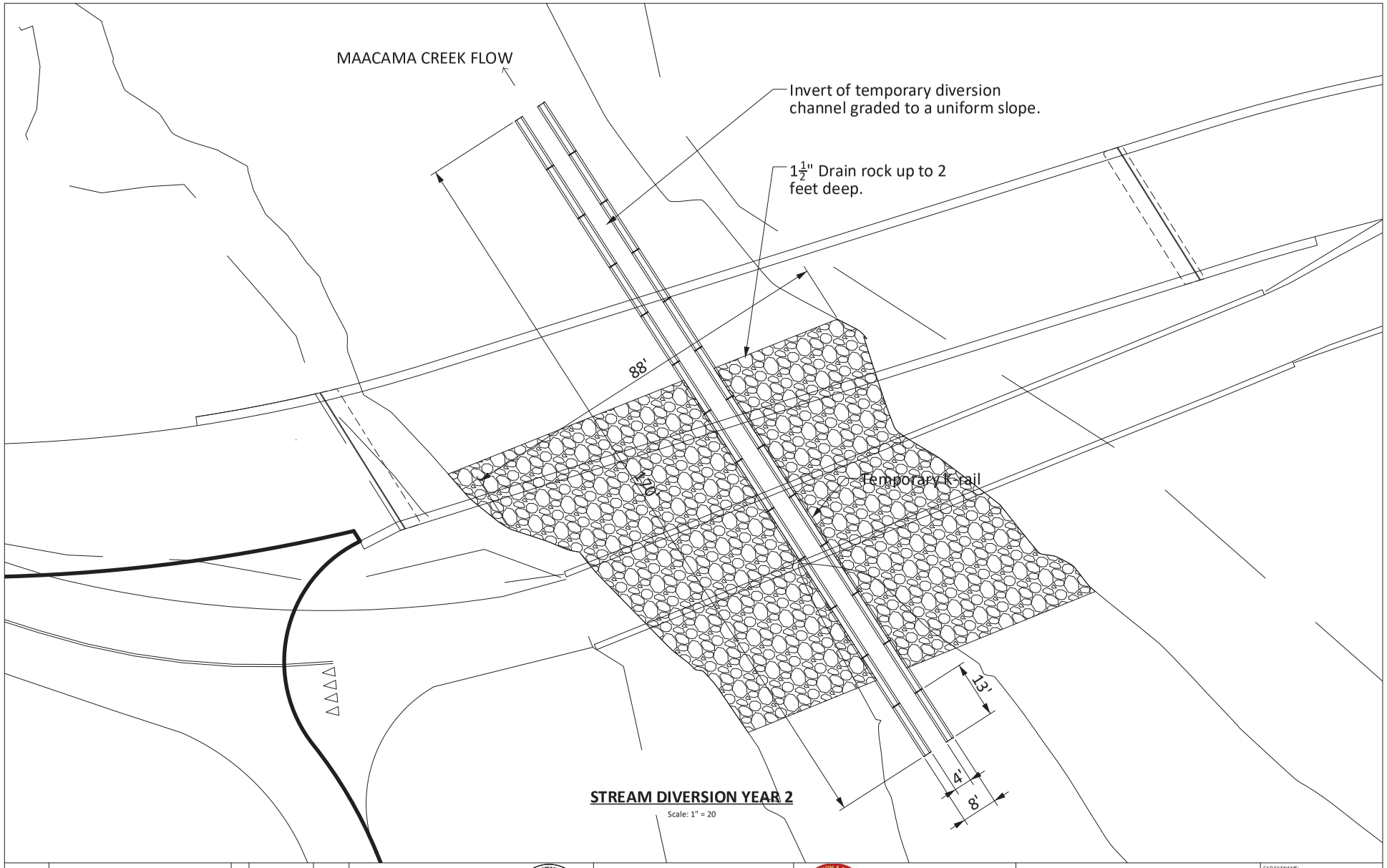
Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES HOEVERTSZ, DIRECTOR

STREAM DIVERSION YEAR 1

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT PROJECT

CAD FILENAME:
DATE:
SHEET: **SD1**
TOTAL SHEETS:



STREAM DIVERSION YEAR 2

Scale: 1" = 20

DATE	REVISION	BY

DESIGN BY

DRAWING BY

CHECKED BY

REGISTERED CIVIL ENGINEER

XX/XX/2019
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. C 82306 — CIVIL — STATE OF CALIFORNIA

Consulting Engineers
315 Bay Street, San Francisco, CA 94133
(415) 989-4551 (415) 989-4135 fax

COUNTY OF SONOMA
DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
JOHANNES HOEVERTSZ, DIRECTOR

STREAM DIVERSION YEAR 2

CHALK HILL ROAD OVER MAACAMA CREEK BRIDGE REPLACEMENT PROJECT

CAD FILENAME:
DATE:
SHEET: **SD2**
TOTAL SHEETS:

Appendix D – USFWS Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Project Code: 2022-0022101
Project Name: Chalk Hill Bridge Replacement Project

March 21, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Project Code: 2022-0022101
Event Code: None
Project Name: Chalk Hill Bridge Replacement Project
Project Type: Bridge - Replacement
Project Description: Replace an existing substandard bridge crossing on Chalk Hill Road over Maacama Creek with a new 2-lane bridge. Demolish and remove the existing bridge. Install scour countermeasures at southern stream bank where new bridge abutments are located, including log rootwads to improve complex stream habitat as well as vegetated rock slope protection. Work will occur during two construction seasons, during the dry season work window of June 15-October 15.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.621334149999996,-122.77355576301686,14z



Counties: Sonoma County, California

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (CA - Sonoma County) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered
Many-flowered Navarretia *Navarretia leucocephala ssp. plieantha* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2491	Endangered
Sebastopol Meadowfoam *Limnanthes vinculans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/404	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: Sonoma County
Name: Erik Schmidt
Address: 2169-G East Francisco Blvd.
City: San Rafael
State: CA
Zip: 94901
Email schmidt@wra-ca.com
Phone: 4155247361

Lead Agency Contact Information

Lead Agency: Department of Transportation
Name: Hugo Ahumada
Phone: 5106228790

Appendix E – USFWS Official Species List

Yingying Cai <yingying.cai@wra-ca.com>

Federal ESA - - NOAA Fisheries Species List Re: Caltrans - Chalk Hill Road Bridge Replacement Project

1 message

NMFS SpeciesList - NOAA Service Account <nmfs.wcrca.specieslist@noaa.gov> Thu, Aug 11, 2022 at 3:02 PM
To: yingying.cai@wra-ca.com

Please retain a copy of each email request that you send to NOAA at nmfs.wcrca.specieslist@noaa.gov as proof of your official Endangered Species Act SPECIES LIST. The email you send to NOAA should include the following information: your first and last name; email address; phone number; federal agency name (or delegated state agency such as Caltrans); mailing address; project title; brief description of the project; and a copy of a list of threatened or endangered species identified within specified geographic areas derived from the NOAA Fisheries, West Coast Region, California Species List Tool. You may only receive this instruction once per week. If you have questions, contact your local NOAA Fisheries liaison.

Yingying Cai <yingying.cai@wra-ca.com>

Caltrans - Chalk Hill Road Bridge Replacement Project

1 message

Yingying Cai <yingying.cai@wra-ca.com> Thu, Aug 11, 2022 at 3:02 PM
To: nmfs.wcrca.specieslist@noaa.gov

To whom it may concern,

Below are the search results for the Healdsburg quadrangle which falls within the project site. Please confirm receipt.

Thanks! Yingying Cai

Quad Name Healdsburg
Quad Number 38122-E7
ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) - X
CC Chinook Salmon ESU (T) - X
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - X
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) -
ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat - X
CC Chinook Salmon Critical Habitat - X
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - X
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -
ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -
ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -
ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -
ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -
ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -
Essential Fish Habitat

Coho EFH - X
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

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NOAA FISHERIES

Species Directory

All Species | ESA Threatened & Endangered | Marine Mammals | Sustainable Seafood

ESA Threatened & Endangered

NOAA Fisheries has jurisdiction over 163 endangered and threatened marine species (79 endangered; 84 threatened), including 65 foreign species (39 endangered; 26 threatened).

Additional species are currently under review or have been proposed for Endangered Species Act listing: 3 petitioned species awaiting a 90-day finding, 12 candidate species for ESA listing, 1 proposed species for ESA listing.

In the table below, the Region column shows if the species can be found in a NOAA Fisheries region. If the species occurs only in areas beyond the U.S. exclusive economic zone and territorial waters, the region is labeled as Foreign.

Species Name

Species Category

All

Protected Status

All

Region

West Coast

Display

All Display All

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Black Abalone *Haliotis cracherodii*	**SPECIES CATEGORY** Invertebrates - Abalone	Species	ESA Endangered	2009	Final	Final	West Coast
Blue Whale *Balaenoptera musculus*	**SPECIES CATEGORY** Whales	Species	ESA Endangered	1970	Final	---	Alaska New England/Mid-Atlantic Pacific Islands Southeast West Coast
Bocaccio (Protected) *Sebastes paucispinis* **Also Known As** Bocaccio, Rock Salmon, Salmon Rockfish, Pacific Red Snapper, Pacific Snapper, Oregon Red Snapper, Oregon Snapper, Longjaw, Merou, Jack, Snapper, Rock Cod, Rockfish	**SPECIES CATEGORY** Fish - Groundfish - Protected Fish	Puget Sound/Georgia Basin DPS	ESA Endangered	2010	Final	FInal	Alaska West Coast
Chinook Salmon (Protected) *Oncorhynchus tshawytscha*	**SPECIES CATEGORY** Fish - Protected Fish	Sacramento River winter-run	ESA Endangered	1994	Final	Final	Alaska West Coast
		Upper Columbia River spring-run	ESA Endangered	1999	Final	Final	Alaska West Coast
		California	ESA	1999	Final	Final	Alaska

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
		coastal	Threatened				West Coast
		Central Valley spring-run	ESA Threatened	1999	Final	Final	Alaska West Coast
		Lower Columbia River	ESA Threatened	1999	Final	Final	Alaska West Coast
		Puget Sound	ESA Threatened	1999	Final	Final	Alaska West Coast
		Snake River fall-run	ESA Threatened	1992	Final	Final	Alaska West Coast
		Snake River spring/summer-run	ESA Threatened	1992	Final	Final	Alaska West Coast
		Upper Willamette River	ESA Threatened	2005	Final	Final	Alaska West Coast
		Upper Klamath-Trinity River	ESA Candidate	---	---	---	Alaska West Coast
		Central Valley spring-run in the San Joaquin River XN	ESA Experimental Population	---	---	---	Alaska West Coast
		Upper Columbia River spring-run in the Okanogan River subbasin XN	ESA Experimental Population	---	---	---	Alaska West Coast
Chum Salmon (Protected) *Oncorhynchus keta*	**SPECIES CATEGORY** Fish - Protected Fish	Columbia River ESU	ESA Threatened	1999	Final	Final	Alaska West Coast
		Hood Canal summer-run ESU	ESA Threatened	1999	Final	Final	Alaska West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Coho Salmon (Protected) *Oncorhynchus kisutch*	**SPECIES CATEGORY** Fish - Protected Fish	Central California Coast ESU	ESA Endangered	2005; 1996 (original)	Final	Final	Alaska West Coast
		Lower Columbia River ESU	ESA Threatened	2005	Final	Final	Alaska West Coast
		Oregon coast ESU	ESA Threatened	2008	Final	Final	Alaska West Coast
		Southern Oregon & Northern California coasts ESU	ESA Threatened	1997	Final	Final	Alaska West Coast
Eulachon *Thaleichthys pacificus*	**SPECIES CATEGORY** Fish - Protected Fish	Southern DPS	ESA Threatened	2010	Final	Final	Alaska West Coast
False Killer Whale *Pseudorca crassidens*	**SPECIES CATEGORY** Whales **SPECIES CATEGORY** Dolphins & Porpoises	Main Hawaiian Islands Insular DPS	ESA Endangered	2012	Final	Final	Pacific Islands
Fin Whale *Balaenoptera physalus*	**SPECIES CATEGORY** Whales	Species	ESA Endangered	1970	Final	---	Alaska New England/Mid-Atlantic Pacific Islands Southeast West Coast
Gray Whale *Eschrichtius robustus*	**SPECIES CATEGORY** Whales	Western North Pacific DPS	ESA Endangered	1994; 1970 (original)	---	---	Alaska West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Green Sturgeon *Acipenser medirostris*	**SPECIES CATEGORY** Fish - Protected Fish	Southern DPS	ESA Threatened	2006	Final	Final	Alaska West Coast
Green Turtle *Chelonia mydas*	**SPECIES CATEGORY** Sea Turtles	Central South Pacific DPS	ESA Endangered	2016	Final	---	Pacific Islands
		Central West Pacific DPS	ESA Endangered	2016	Final	---	Pacific Islands
		Mediterranean DPS	ESA Endangered - Foreign	2016	---	---	Foreign
		Central North Pacific DPS	ESA Threatened	2016	Final	---	Pacific Islands
		East Pacific DPS	ESA Threatened	2016	Final	---	West Coast
		North Atlantic DPS	ESA Threatened	2016	Final	Final	New England/Mid-Atlantic Southeast
		South Atlantic DPS	ESA Threatened	2016	Final	---	Southeast
		East Indian-West Pacific DPS	ESA Threatened - Foreign	2016	---	---	Foreign
		North Indian DPS	ESA Threatened - Foreign	2016	---	---	Foreign
		Southwest Indian DPS	ESA Threatened - Foreign	2016	---	---	Foreign
		Southwest Pacific DPS	ESA Threatened - Foreign	2016	---	---	Foreign

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Guadalupe Fur Seal *Arctocephalus townsendi*	**SPECIES CATEGORY** Seals & Sea Lions	Species	ESA Threatened	1985	---	---	Alaska West Coast
Humpback Whale *Megaptera novaeangliae*	**SPECIES CATEGORY** Whales	Central America DPS	ESA Endangered	2016	Final	Final	West Coast
		Western North Pacific DPS	ESA Endangered	2016	Final	Final	Alaska
		Arabian Sea DPS	ESA Endangered - Foreign	2016	Final	---	Foreign
		Cape Verde Islands/Northwest Africa DPS	ESA Endangered - Foreign	2016	Final	---	Foreign
		Mexico DPS	ESA Threatened	2016	Final	Final	Alaska West Coast
Killer Whale *Orcinus orca* **Also Known As** Orca	**SPECIES CATEGORY** Whales **SPECIES CATEGORY** Dolphins & Porpoises	Southern Resident DPS	ESA Endangered	2005	Final	Final	Alaska West Coast
Leatherback Turtle *Dermochelys coriacea*	**SPECIES CATEGORY** Sea Turtles	Species	ESA Endangered	1970	Final	Final (U.S. Caribbean) Final (U.S. West Coast)	New England/Mid-Atlantic Pacific Islands Southeast West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Loggerhead Turtle *Caretta caretta*	**SPECIES CATEGORY** Sea Turtles	North Pacific Ocean DPS	ESA Endangered	2011	Final	No	Pacific Islands West Coast
		Mediterranean Sea DPS	ESA Endangered - Foreign	2011	---	---	Foreign
		Northeast Atlantic Ocean DPS	ESA Endangered - Foreign	2011	---	---	Foreign
		North Indian Ocean DPS	ESA Endangered - Foreign	2011	---	---	Foreign
		South Pacific Ocean DPS	ESA Endangered - Foreign	2011	---	---	Foreign
		Northwest Atlantic Ocean DPS	ESA Threatened	2011	Final	Final	New England/Mid-Atlantic Southeast
		South Atlantic Ocean DPS	ESA Threatened - Foreign	2011	---	---	Foreign
		Southeast Indo-Pacific Ocean DPS	ESA Threatened - Foreign	2011	---	---	Foreign
		Southwest Indian Ocean DPS	ESA Threatened - Foreign	2011	---	---	Foreign
North Pacific Right Whale *Eubalaena japonica*	**SPECIES CATEGORY** Whales	Species	ESA Endangered	2008; 1970 (original)	Final	Final	Alaska West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Oceanic Whitetip Shark *Carcharhinus longimanus*	**SPECIES CATEGORY** Fish - Highly Migratory Fish - Protected Fish - Sharks	Species	ESA Threatened	2018	Under Development	Not Prudent	New England/Mid-Atlantic Pacific Islands Southeast West Coast
Olive Ridley Turtle *Lepidochelys olivacea*	**SPECIES CATEGORY** Sea Turtles	Mexico's Pacific coast breeding populations	ESA Endangered	1978	Final	---	West Coast
		All other populations	ESA Threatened	---	---	---	Pacific Islands Southeast West Coast
Scalloped Hammerhead Shark *Sphyrna lewini*	**SPECIES CATEGORY** Fish - Highly Migratory Fish - Protected Fish - Sharks	Eastern Pacific DPS	ESA Endangered	2014	---	No	West Coast
		Eastern Atlantic DPS	ESA Endangered - Foreign	2014	---	---	Foreign
		Central & Southwest Atlantic DPS	ESA Threatened	2014	---	No	Southeast
		Indo-West Pacific DPS	ESA Threatened	2014	---	No	Pacific Islands
Sei Whale *Balaenoptera borealis*	**SPECIES CATEGORY** Whales	Species	ESA Endangered	1970	Final	---	Alaska New England/Mid-Atlantic Pacific Islands Southeast West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Sockeye Salmon (Protected) *Oncorhynchus nerka*	**SPECIES CATEGORY** Fish - Protected Fish	Snake River ESU	ESA Endangered	1991	Final	Final	Alaska West Coast
		Ozette Lake ESU	ESA Threatened	1999	Final	Final	Alaska West Coast
Sperm Whale *Physeter macrocephalus*	**SPECIES CATEGORY** Whales	Species	ESA Endangered	1970	Final	---	Alaska New England/Mid-Atlantic Pacific Islands Southeast West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Steelhead Trout *Oncorhynchus mykiss*	**SPECIES CATEGORY** Fish - Protected Fish	Southern California DPS	ESA Endangered	1997	Final	Final	Alaska West Coast
		California Central Valley DPS	ESA Threatened	1998	Final	Final	Alaska West Coast
		Central California Coast DPS	ESA Threatened	1997	Final	Final	Alaska West Coast
		Lower Columbia River DPS	ESA Threatened	1998	Final	Final	Alaska West Coast
		Middle Columbia River	ESA Threatened	1999	Final	Final	Alaska West Coast
		Northern California DPS	ESA Threatened	2000	Final	Final	Alaska West Coast
		Puget Sound DPS	ESA Threatened	2007	Final	Final	Alaska West Coast
		Snake River Basin DPS	ESA Threatened	2006	Final	Final	Alaska West Coast
		South-Central California Coast DPS	ESA Threatened	1997	Final	Final	Alaska West Coast
		Upper Columbia River DPS	ESA Threatened	2006; 1997 (original)	Final	Final	Alaska West Coast
		Upper Willamette River DPS	ESA Threatened	1999	Final	Final	Alaska West Coast
		Middle Columbia River XN	ESA Experimental Population	---	---	---	Alaska West Coast

Species Name ▼	Species Category	Listed Entity	Protected Status	Year Listed	Recovery Plan	Critical Habitat	Region
Steller Sea Lion *Eumetopias jubatus*	**SPECIES CATEGORY** Seals & Sea Lions	Western DPS	ESA Endangered	1997; 1990 (original)	Final	Final	Alaska West Coast
White Abalone *Haliotis sorenseni*	**SPECIES CATEGORY** Invertebrates - Abalone	Species	ESA Endangered	2001	Final	Not Prudent	West Coast
Yelloweye Rockfish *Sebastes ruberrimus*	**SPECIES CATEGORY** Fish - Protected Fish	Puget Sound/ Georgia Basin DPS	ESA Threatened	2010	Final	Final	Alaska West Coast

Appendix F – Plant and Wildlife Species Observed during the Site Visits

Appendix E. Plant and wildlife species observed in the Biological Study Area on June 6, 2019 and September 14, 2021.

Wildlife	
Scientific Name	**Common Name**
Mammals	
Procyon lotor	raccoon (scat)
Sciurus griseus	California gray squirrel
Birds	
Mimus polyglottos	northern mockingbird
Cathartes aura	turkey vulture
Aphelocoma californica	California scrub jay
Melozone crissalis	California towhee
Amphibians	
Anaxyrus boreas	western toad

Plants	
Scientific Name	**Common Name**
Aesculus californica	Buckeye
Alnus rubra	Red alder
Arbutus menziesii	Madrone
Avena barbata	Slim oat
Baccharis pilularis	Coyote brush
Baccharis salicifolia ssp. salicifolia	Mule fat
Briza maxima	Rattlesnake grass
Briza minor	Little rattlesnake grass
Brodiaea elegans ssp. elegans	Harvest brodiaea
Bromus caroli-henrici	Weedy brome
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft chess
Carduus pycnocephalus ssp. pycnocephalus	Italian thistle
Carex obnupta	Slough sedge

Centaurea solstitialis	Yellow starthistle
Centromadia fitchii	Spikeweed
Chlorogalum pomeridianum	Amole
Cichorium intybus	Chicory
Conium maculatum	Poison hemlock
Convolvulus arvensis	Field bindweed
Croton setiger	Turkey-mullein
Cynosurus echinatus	Dogtail grass
Danthonia californica	California oatgrass
Dipsacus sativus	Indian teasel
Dittrichia graveolens	Stinkwort
Elymus caput-medusae	Medusa head
Elymus glaucus	Blue wildrye
Epilobium brachycarpum	Willow herb
Festuca perennis	Italian rye grass
Foeniculum vulgare	Fennel
Fraxinus latifolia	Oregon ash
Geranium dissectum	Wild geranium
Geranium molle	Crane's bill geranium
Hirschfeldia incana	Short-podded mustard
Hordeum murinum	Foxtail barley
Juglans hindsii	Northern California black walnut
Juncus effusus	Common bog rush
Lathyrus hirsutus	Caley pea
Lupinus nanus	Sky lupine
Lysimachia arvensis	Scarlet pimpernel
Lythrum hyssopifolia	Hyssop loosestrife
Medicago polymorpha	Bur clover
Melica torreyana	Torrey's melica
Phytolacca americana var. americana	American pokeweed

Pinus longaeva	Bristlecone pine
Populus fremontii ssp. fremontii	Cottonwood
Quercus agrifolia	Coast live oak
Quercus lobata	Valley oak
Rosa nutkana	Nootka rose
Rubus armeniacus	Himalayan blackberry
Rumex acetosella	Sheep sorrel
Rumex crispus	Curly dock
Salix exigua	Narrowleaf willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
Sidalcea diploscypha	Fringed checker mallow
Sonchus asper ssp. asper	Prickly sow thistle
Sonchus oleraceus	Common sow thistle
Stipa pulchra	Purple needle grass
Symphoricarpos albus var. laevigatus	Common snowberry
Torilis arvensis	Field hedge parsley
Toxicodendron diversilobum	Poison oak
Trifolium hirtum	Rose clover
Trifolium subterraneum	Subterranean clover
Typha sp.	-
Umbellularia californica	California bay
Verbascum thapsus	Woolly mullein
Veronica anagallis-aquatica	Water speedwell
Vinca major	Vinca
Vitis californica	California wild grape
Vitis vinifera	Cultivated grape
Xanthium strumarium	Cocklebur

Appendix G – Delineation of Potential Waters of the U.S.

Delineation of Potential Waters of the U.S.

Chalk Hill Road Bridge Replacement Project

Unincorporated, Sonoma County, California





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Appendix E - Antecedent Precipitation Tool Analysis

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List of Acronyms

CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CSRL	California Soil Resource Lab
CWA	Clean Water Act
DEM	Digital Elevation Model
DWR	Department of Water Resources
EPA	Federal Environmental Protection Agency
FAC	Facultative Plant
FACU	Facultative Upland Plant
FACW	Facultative Wetland Plant
HTL	High Tide Line
HUC	Hydrologic Unit Code
MHW	Mean High Water
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWPL	National Wetland Plant List
OBL	Obligate Wetland Plant
OHWM	Ordinary High-Water Mark
RHA	Rivers and Harbors Act
RWQCB	Regional Water Quality Control Board
SWRCB	California State Water Resources Control Board
UPL	Upland Plant
USGS	U.S. Geological Survey
WRA	WRA, Inc.

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1 INTRODUCTION

This report presents the results of a delineation of aquatic resources that are potential waters of the U.S. as defined by the Clean Water Act (CWA) and waters of the State as defined by the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Wetland Policy, SWRCB 2019). The Study Area for this delineation is the Chalk Hill Road Bridge Replacement Project located in unincorporated Sonoma County, California (Study Area; Appendix A – Figure 1). The Study Area consists of approximately 16 acres and includes the following parcels: APN 132-080-023, 132-060-013, 132-080-003, 132-060-013, 132-080-022 and 132-080-017.

On June 6, 2019, WRA, Inc. (WRA) conducted a delineation within the Study Area to identify wetlands and non-wetland waters potentially subject to jurisdiction by the U.S. Army Corps of Engineers (Corps) under Section 404 of the CWA and the California State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB) as defined in the State Wetland Policy (SWRCB 2019). A second site visit was conducted on October 27, 2022, to assess if any changes to the delineation may be appropriate. No changes from 2019 delineation occurred. The following sections describe the regulatory background and methods used to guide the delineation and provide a summary of wetlands, non-wetland waters, and non-wetland riparian within the Study Area. This delineation is considered "potential" subject to the approval of the Corps and, where appropriate, RWQCB[1].

[1] *Per the State Wetland Policy, the SWRCB or local RWQCB "shall rely on any wetland area delineation from a final aquatic resource report verified by the U.S. Army Corps of Engineers (Corps) for the purposes of determining the extent of wetland waters of the U.S. A delineation of any wetland areas potentially impacted by the project that are not delineated in a final aquatic resource report verified by the Corps shall be performed using the methods described in the…"1987 Manual and Supplements" to determine whether the area meets the state definition of a wetland."*

2 REGULATORY BACKGROUND

The regulations pertaining to this preliminary delineation study are summarized below and include Waters of the U.S., regulated by Section 404 of the Clean Water Act (CWA) and Waters of the State regulated through Section 401 of the CWA and State Wetland Policy.

2.1 Section 404 of the Clean Water Act

The objective of the CWA is to maintain and restore the chemical, physical, and biological integrity of the waters of the U.S. (33 CFR Part 328 Section 328.4). Waters of the U.S. is the encompassing term for areas that qualify for federal regulation under Section 404 of the CWA. Section 404 of the CWA gives the U.S. Environmental Protection Agency (EPA) and the Corps regulatory and permitting authority regarding discharge of dredged or fill material into "navigable" waters of the U.S. Section 502(7) of the CWA defines navigable waters as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the CWA. A summary of this definition of "waters of the United States" in 33 CFG 328.3 includes (1) waters used for commerce and subject to tides; (2) interstate waters and wetlands; (3) "other waters" such as intrastate lakes, rivers, streams, and wetlands; (4) impoundments of waters; (5) tributaries of waters; (6) territorial seas; and (7) wetlands adjacent to waters. Therefore, for purposes of determining Corps jurisdiction under the CWA, "navigable waters" as defined in the CWA are the same as "waters of the United States" defined in the CFR above. Waters of the U.S include non-isolated wetlands and "other waters," also referred to as non-wetland waters.

2.1.1 Wetlands

Wetlands are defined in 33 CFR 328.3 (b) as:

> *...those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The basis for determining whether a given area is a wetland for the purposes of Section 404 of the CWA is outlined in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Delineation Manual* for Arid West (Corps 2008a). As defined in 33 CFR 328.4 (c), the extent of federal jurisdiction within wetlands is defined as extending to the limit of the wetland as determined using the methods outlined in the manuals.

2.1.2 Non-Wetland Waters

The limit of federal jurisdiction in non-tidal non-wetland waters extends to the ordinary high water mark (OHWM) which is defined in 33 CFR 328.3 (e) as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

2.1.3 Areas Potentially Exempt from Section 404 Jurisdiction

Some areas that meet the technical criteria for wetlands or waters may not be jurisdictional under the CWA per Section 404 regulations and the Corps Manual. Included in this category are:

- Some man-induced wetlands, including areas that are maintained only due to the presence of man-induced hydrology (1987 Corps Manual)
- Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (33 CFR 328.3a)
- Ditches dug wholly in, and draining only uplands and that do not carry a relatively permanent flow of water (51 Fed. Reg. 41206, Corps 2008b)
- Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing·(51 Fed. Reg. 41206)
- Artificial reflecting or swimming pools, or other similar ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons (51 Fed. Reg. 41206)
- Water-filled depressions created as a result of construction activity (51 Fed. Reg. 41206)
- Pits excavated in upland for fill, sand, or gravel (51 Fed. Reg. 41206)

In addition, on December 2, 2008, the Corps and the EPA issued joint guidance on implementing the June 19, 2006, U.S. Supreme Court opinions resulting from Rapanos v. United States and Carabell v. United States (Rapanos) cases. The guidance states that the agencies will assert jurisdiction over:

- Non-navigable tributaries that are not relatively permanent, where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months);
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to but that do not directly abut a relatively permanent non navigable tributary.

The agencies generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) and
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The agencies will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters.
- Significant nexus includes consideration of hydrologic and ecologic factors.

This “Rapanos Guidance” is currently relied upon by the Corps and USEPA in making determinations regarding the jurisdictional status of wetlands and other waters of the United States which are not exempted by regulations or the Corps Manual.

2.2 Section 10 of the Rivers and Harbors Act

The Corps also has jurisdiction over "navigable waters" under Section 10 of the Rivers and Harbors Act of 1899. Section 10 of this Act applies to tidal areas below mean high water (MHW) and includes tidal areas currently subject to tidal influence, as well as historic tidal areas behind levees that both historically and presently reside at or below MHW. "Navigable waters of the United States," as defined in 33 CFR Part 329, are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

The act prohibits any unauthorized action that obstructs navigable capacity. These actions can include building of structures; excavation, fill; and alterations and modifications to navigable waters (33 USC 403). A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity. The upper limit of navigable water is at the point along its length where the character of the river changes from navigable to non-navigable, such as at a major fall or rapids. Since the upper limit of navigability of waterways under Section 10 jurisdiction is sometimes difficult to discern, determinations of navigability under Section 10 are often made by the Corps and kept on file, independent of submitted permit applications or delineations.

2.3 Waters of the State

The Porter-Cologne Water Quality Control Act gives the SWRCB authority to regulate discharge of dredged or fill material that may affect the quality of "waters of the state." "Waters of the state" are defined broadly as:

> *any surface water or groundwater, including saline waters, within the boundaries of the state.*

In April 2019, the SWRCB adopted the State Wetland Policy, which provides a state wetland definition, procedures, and requirements for regulation of the discharge of dredge or fill material to wetlands and non-wetland waters of the state. The State Wetland Policy also includes exemptions from regulation of dredge and fill discharges for certain types of wetland and non-wetland waters features, as well as for certain classes of activities, such as activities covered by an existing RWQCB or SWRCB Order. The state wetland definition that became effective May 28, 2020, is similar to, but slightly different from that used by the Corps:

> *An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.*

The State Wetland Policy utilizes existing Corps delineation procedures (Environmental Laboratory 1987, Corps 2008a, 2010). According to the State Wetland Policy, the SWRCB and RWQCBs generally rely on the Corps for verification of wetland and non-wetland waters as part of an aquatic resource report. Any potential wetland area not identified in a report verified by the Corps is required to be delineated using Corps methods for consideration as a state wetland and verification by SWRCB or RWQCB staff. This report includes wetlands and non-wetland waters meeting both the Corps and state wetland definitions. Some features mapped as non-wetland waters under the Corps wetland definition may be considered wetlands under the state definition.

This report identifies wetlands and non-wetland waters according to the Corps definitions and criteria, consistent with the State Wetland Policy's reliance of these criteria. This report also recognizes that some non-wetland waters features may meet the wetland definition of the State Wetland Policy. The State Wetland Policy regulates wetlands and non-wetland waters equivalently. Therefore, the classification of an unvegetated feature as a wetland or non-wetland water does not affect the scope of State regulation of that feature. In contrast, feature classification for purposes of Corps jurisdiction can affect some regulatory permitting decisions, such as determining the applicability of Nationwide Permit Program thresholds. Therefore, the Corps definitions are relied upon for feature classifications in this report. In some cases, features mapped and classified as non-wetland waters may meet the State Wetland Policy definition of a wetland, where those features contain anaerobic substrates. Regardless of how they are defined, wetlands and non-wetland waters deemed jurisdictional may be regulated by the RWQCB and/or SWRCB under the State Wetland Policy.

3 STUDY AREA DESCRIPTION

The approximately 16-acre Study Area is located in unincorporated Sonoma County, California (Appendix A – Figure 1). The Study Area can be reached by taking State Route 128 East from Highway 101. Head south on Chalk Hill Road approximately 8 miles to reach the Study Area. The adjacent land use is residential (single family homes) and agricultural. Land uses within the Study Area include residential and agriculture. The Study Area is comprised of Maacama Creek and surrounding residential or agriculture land. The land around Maacama Creek is rural residential development and activities typical of such land use, as well as vineyard productions.

3.1 Vegetation

Natural or naturalized vegetation within the Study Area consists of oak woodlands, knobcone pine forest, riparian forests and scrub, native and non-native grasslands, and upland scrub communities.

Oak Woodlands. Several types of oak woodlands are present in the Study Area, located in uplands near the stream or hillslopes along Chalk Hill Road. Dominant oaks include coast live oak (*Quercus agrifolia*), valley oak (Q. *lobata*), and blue oak (Q. *douglasii*).

Knobcone Pine Forest. Knobcone forest is located on north-facing slopes. The understory is of sparse shrubs and continuous cover of non-native grass.

Riparian forests and scrub. Riparian forests in the Study Area include California bay woodland, valley oak woodland, and valley oak-Oregon ash woodland. These forests are located along the banks of Maacama Creek. Riparian scrub in the Study Area includes arroyo willow scrub and Himalayan blackberry brambles.

Grasslands. Both native and non-native grasslands are present in the Study Area. Small stands of purple needle grass (*Stipa pulchra*) are dispersed within the non-native wild oats grassland.

Upland Scrub. Upland scrub includes coyote brush scrub.

Developed portions of the Study Area include vineyards, residences and associated lands and Chalk Hill Road.

3.2 Soils

The Soil Survey of Sonoma County (USDA 1972) and SoilWeb (CSRL 2022) list five soil mapping units within the Study Area: Haire clay loam, 0 to 9 percent slope, Riverwash, Laniger loam, 15 to 30 percent slope, Laniger loam, 30 to 50 percent slope, and Laniger loam 5 to 9 percent slope. Descriptions of the soil series that comprise the soil mapping units are provided below. The distribution of these soil mapping units within the Study Area is depicted in Appendix A – Figure 2.

> **Haire Series**: Haire soils consist of clay loam formed in terrace deposits and in residuum weathered from arkosic sandstone and granodiorite. These soils are moderately well drained with very slow permeability and slow to rapid runoff. Typical vegetation includes annual grasses. These soils may become hydric when located on basin floors (USDA 2022).
>
> Haire soils have a very dark grayish brown (10YR 3/2) A horizon of light clay loam to 24 inches below the surface, underlain by a dark grayish brown (2.5Y 4/2) clay to 26 inches.

A variegated dark brown (10YR 3/3) and olive brown (2.5Y 4/4) of very gravelly clay loam occurs from 36 to 60 inches.

Laniger Series: Laniger soils consist of fine sandy loam formed from weathered rhyolite. These soils are somewhat excessively drained with moderate to rapid permeability and medium to rapid runoff. Typical vegetation on these soils includes blue oak woodlands and other broad-leafed forests or chaparral. These soils may become hydric when located in drainageways (USDA 2022).

Laniger soils have a very dark brown (10YR 2/2) to dark brown (10YR 3/3) fine sandy loam A horizon to 16 inches, underlain by a dark yellowish brown (20YR ¾) fine sandy loam B horizon to 38 inches. Bedrock of rhyolitic tuff begins at 38 inches.

Riverwash: Riverwash consists of very recent depositions of gravel, sand and silt alluvium along major streams and their tributaries. Riverwash does not have soil.

3.3 Hydrology

The Study Area is located in the Middle Russian River local watershed (HUC 10: 1801011006), within the Russian River Regional watershed (HUC 8: 18010110) (NRCS 2022). Hydrologic sources within the Study Area include direct precipitation, and high groundwater in Maacama Creek. Maacama Creek is a mapped blue-line stream on the Healdsburg USGS topographic map (Figure 3). Annual rainfall within this watershed averages 41 inches, with the majority of rain falling between November and March (WRCC 2022). Freshwater Forested/Shrub Wetland and Intermittent Stream are documented in the Study Area by the National Wetland Inventory (NWI) and California Aquatic Resources Inventory (CARI) databases (USFWS 2022; SFEI 2022a).

The natural hydrology of the site is relatively intact; however, the watershed is developed with vineyards and rural residences. The Maacama Creek watershed drains approximately 69.7 square miles and is a tributary of the Russian River. The confluence of Maacama Creek and the Russian River is approximately 1.45 miles downstream of the Study Area, with a tributary, Franz Creek, flowing into Maacama Creek between the confluence and the Study Area.

4 METHODS

WRA biologists performed a delineation of aquatic resources within the Study Area on June 6, 2019, with a review site visit on October 27, 2022. Prior to conducting the evaluation, WRA reviewed a range of background materials including the *Soil Survey of Sonoma County* (USDA 1972), SoilWeb (CSRL 2022), the National Wetlands Inventory (NWI; USFWS 2022), the California Aquatic Resource Inventory (SFEI 2022), and the U.S. Geological Survey (USGS) Healdsburg 7.5-minute quadrangle map (USGS 2022). WRA also reviewed historic aerial imagery from Google Earth (Google Earth 2022). In addition, LiDAR data was incorporated to final boundaries to corroborate GPS data collected during the delineation.

During the on-site evaluation, WRA followed the methods outlined in U.S. Army Corps of Engineers Wetlands Delineation Manual (Corps Manual; Environmental Laboratory 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Supplement; Corps 2008) and A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States (OHWM Guide; Lichvar and McColley 2008). Potentially jurisdictional wetlands were identified, and their boundaries mapped using the Routine Method described in the Corps Manual. The jurisdictional limits of non-wetland waters under Section 404 of the CWA were mapped based on a combination of field indicators described in the OHWM Guide.

4.1 Wetlands

WRA followed the Routine Method to evaluate the Study Area for the presence or absence of indicators of the three wetland parameters described in the Corps Manual (Environmental Laboratory 1987) and Arid West Supplement (Corps 2008a). Data on vegetation, hydrology, and soils were collected at sample points within potential wetland communities and adjacent upland areas. Sample points that contained positive indicators for hydrophytic vegetation, hydric soils, and wetland hydrology were considered to be wetland. Except in cases of atypical or problematic wetland situations (i.e., difficult wetland situations, as described below), sample points that lacked one or more indicators were considered to be upland. Sample point data were reported on Arid West Supplement data forms. Sample point locations were recorded using a handheld GPS unit with mapping grade accuracy.

4.1.1 Vegetation

Plant species observed in the Study Area were identified using the Jepson eFlora (Jepson Flora Project 2022). Plants were assigned a wetland indicator status according to the National Wetland Plant List (NWPL; Corps 2020).

Wetland indicator statuses listed in the NWPL are based on the expected frequency of occurrence in wetlands, as follows in Table 1:

Table 1. Explanation of the Wetland Indicator Statues in the National Wetland Plant List

Classification* (Abbreviation)	Definition	Hydrophytic Species? (Y/N)
Obligate (OBL)	Almost always is a hydrophyte, rarely in uplands	Y
Facultative Wetland (FACW)	Usually is a hydrophyte but occasionally found in uplands	Y
Facultative (FAC)	Commonly occurs as either a hydrophyte or non-hydrophyte	Y
Facultative Upland (FACU)	Occasionally is a hydrophyte but usually occurs in uplands	N
Upland / Not Listed (UPL / NL)	Rarely is a hydrophyte, almost always in uplands	N

* See Corps (2020)

The presence of hydrophytic vegetation was then determined based on indicator tests described in the Arid West Supplement. The Arid West Supplement requires that a three-step process be conducted to determine if hydrophytic vegetation is present. The procedure first requires the delineator to apply the "50/20 rule" (Indicator 1; Dominance Test) described in the manual. To apply the "50/20 rule", dominant species are chosen independently from each stratum of the community. Dominant species are determined for each vegetation stratum from a sampling plot of an appropriate size surrounding the sample point. Dominants are the most abundant species that individually or collectively account for more than 50 percent of the total vegetative cover in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total vegetative cover. If greater than 50 percent of the dominant species has an OBL, FACW, or FAC status, ignoring + and - qualifiers, the sample point meets the hydrophytic vegetation criterion.

If the sample point fails Indicator 1 and both hydric soils and wetland hydrology are not present, then the sample point does not meet the hydrophytic vegetation criterion, unless the site is a problematic wetland situation. However, if the sample point fails Indicator 1 but hydric soils and wetland hydrology are both present, the delineator must apply Indicator 2.

Indicator 2 is known as the Prevalence Index. The prevalence index is a weighted average of the wetland indicator status for all plant species within the sampling plot. Each indicator status is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). Indicator 2 requires the delineator to estimate the percent cover of each species in every stratum of the community and sum the cover estimates for any species that is present in more than one stratum. The delineator must then organize all species into groups according to their wetland indicator status and calculate the Prevalence Index using the following formula, where A equals total percent cover:

$$PI = \frac{A_{OBL} + 2A_{FACW} + 3A_{FAC} + 4A_{FACU} + 5A_{UPL}}{A_{OBL} + A_{FACW} + A_{FAC} + A_{FACU} + A_{UPL}}$$

The Prevalence Index will yield a number between 1 and 5. If the Prevalence Index is equal to or less than 3, the sample point meets the hydrophytic vegetation criterion. However, if the community fails Indicator 2, the delineator must proceed to Indicator 3.

Indicator 3 is known as Morphological Adaptations. If more than 50 percent of the individuals of a FACU species have morphological adaptations for life in wetlands, that species is considered to be a hydrophyte and its indicator status should be reassigned to FAC. If such observations are made, the delineator must recalculate Indicators 1 and 2 using a FAC indicator status for this species. The sample point meets the hydrophytic vegetation criterion if either test is satisfied.

4.1.2 Soils

The Natural Resource Conservation Service ("NRCS") defines a hydric soil as follows:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*
>
> Federal Register July 13, 1994,
> U.S. Department of Agriculture ("USDA"), NRCS

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Hydric soils can have a hydrogen sulfide (rotten egg) odour, low chroma matrix color, generally designated 0, 1, or 2, used to identify them as hydric, presence of redox concentrations, gleyed or depleted matrix, or high organic matter content.

Specific indicators that can be used to determine whether a soil is hydric for the purposes of wetland delineation are provided in the NRCS *Field Indicators of Hydric Soils in the U.S.* (USDA 2010). The Arid West Supplement provides a list of 23 of these hydric soil indicators which are known to occur in the Arid West region. Soil samples were collected and described according to the methodology provided in the Arid West Supplement. Soil chroma and values were determined by utilizing a standard Munsell soil color chart (Xrite 2013).

Hydric soils were determined to be present if any of the soil samples met one or more of the 23 hydric soil indicators described in the Arid West Supplement.

4.1.3 Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (a minimum of 14 consecutive days in the Arid West region). Evidence of wetland hydrology can include primary indicators, such as visible inundation or saturation, drift deposits, oxidized root channels, and salt crusts, or secondary indicators such as the FAC-neutral test, presence of a shallow aquitard, or crayfish burrows. The Arid West Supplement contains 16 primary hydrology indicators and 10 secondary hydrology indicators. Only one primary indicator is required to meet the wetland hydrology criterion; however, if secondary indicators are used, at least two secondary indicators must be present to conclude that an area has wetland hydrology.

The presence or absence of the primary or secondary indicators described in the Arid West Supplement was utilized to determine if sample points within the Study Area met the wetland hydrology criterion.

A hydrologic analysis using the Antecedent Precipitation Tool (Deters 2022) was conducted to determine whether precipitation levels during the 3 months prior to the June 2019 site visit were above, below, or within the 30-year average for the region as well as to determine if the region was experiencing long-term drought conditions. Long-term precipitation data were obtained from

weather stations in the vicinity of the Study Area. Drought condition data were obtained from monthly Palmer Drought Severity Index dataset published by the National Ocean and Atmospheric Administration.

During the 3-month period prior to the 2019 site visit, precipitation was wetter than normal, and at the time of the site visit, the region was experiencing Normal drought conditions. The full results of the Antecedent Precipitation Tool analysis are provided as Appendix E.

4.1.4 Boundary Determinations

Wetland boundaries were identified using a combination of indicators observed on the ground, most often corresponding to changes in topography and dominant vegetation, in addition to other indicators.

4.2 Non-Wetland Waters

This study also evaluated the presence of non-wetland waters using Corps manuals and guidance for the identification of OHWM indicators (Lichvar and McColley 2008). Examples of non-wetland waters include lakes, rivers, and streams in addition to all areas below the HTL in areas subject to tidal influence. Non-wetland water types potentially subject to both Corps and RWQCB/SWRCB jurisdiction were investigated and identified in the field and as part of this report.

4.2.1 Ordinary High-Water Mark

Consistent with Corps delineation methodology, the OHWM was used to identify the limits of non-wetland waters. The location of the OHWM was determined based on a combination of indicators observed on the ground (e.g., water stains, scour marks, and sediment sorting). Where direct access to the OHWM was feasible, it was mapped in the field using a GPS unit with mapping grade accuracy. Where direct access to the OHWM was not feasible, the location of the OHWM was hand drawn in the field on aerial photographs and topographical maps for subsequent digitizing in ArcGIS. For smaller streams, the width between the OHWM was visually estimated in the field and recorded for each feature. For larger features, the OHWM was mapped directly, and the average width measured with ArcGIS.

4.3 Difficult Wetland Situations

The Arid West Supplement (Corps 2008a) includes recommended procedures for completing wetland delineations in areas of “difficult wetland situations” in which wetlands may lack one or more indicators due to natural or anthropogenic factors; these are discussed as atypical or problematic wetland conditions in the Corps Manual (Environmental Laboratory 1987). Although the Corps Manual and Arid West Supplement (Corps 2008a) were utilized in the wetland determination, they do not provide exhaustive lists of the difficult situations and problem areas that can arise during delineations in the Arid West. In these situations, the Corps Manual and Regional Supplements stress the importance of using best professional judgment and knowledge of the ecology of the wetlands in the region during the collection and interpretation of data in difficult sites.

5 RESULTS

A map showing the location and extent of all potential jurisdictional aquatic features mapped within the Study Area is provided in Appendix A – Figure 4. A summary of acreages of potential

Corps jurisdiction under Section 404 of the CWA and potential RWQCB jurisdiction under Section 401 of the CWA is provided in Table 2 below. Wetland Determination Data Forms are provided as Appendix B. Photographs of the Study Area are provided as Appendix C. A list of all plant species observed during the delineation site visits is included as Appendix D. The results of a precipitation and hydrological analysis is included as Appendix E.

No difficult wetland conditions or Atypical Situations or man-induced wetlands were observed. Maacama Creek is a tributary to the Russian River, and is not a designated navigable waterway under the Rivers and Harbors Act.

Table 2. Summary of Wetlands and Non-Wetland Waters Mapped Within the Study Area

Feature Type	Classification[1]	Potential Section 404 Waters of the U.S.		Potential Waters of the State	
		Acres	Linear Feet	Acres	Linear Feet
Wetlands					
Seasonal Wetland	PEM2A	0.01	-	0.01	-
Non-Wetland Water					
Stream	R4SB7J	1.09	576	1.09	576
	Total:	**1.10**	**576**	**1.09**	**576**

[1]See FGDC 2013

5.1 Wetlands

Seasonal Wetland

A portion of a seasonal wetland swale (SW-1) is present in the very southern portion of the Study Area. Seasonal wetland swales are concave linear features without a defined bed and bank and open-ended concavity. The feature is located at the base of a small slope and extends south, outside of the southern boundary of the Study Area. Vegetation is dominated by Italian rye grass (*Festuca perennis*; FAC). Redoximorphic concentrations were observed in dark soils; soils meet Redox Dark Surface (F6) hydric soil indicator. No indicators of hydrology were observed and are considered naturally problematic. However, the feature is located in a topographic position which likely collects water and exhibits hydrophytic vegetation and hydric soils; as such, hydrology is presumed present but not observed due to timing of the delineation. The boundary of the feature was delineated using shift in vegetation and topography.

Seasonal wetland was classified as PEM2A: Palustrine (P), emergent (EM), non-persistent (2), temporarily flooded (A).

5.2 Non-Wetland Waters

Stream

Features in the stream category are linear features that have indicators of OHWM and within which water flows in a channel, fed by groundwater. Maacama Creek (PS-1) is the stream feature within the Study Area. The stream is not a navigable water and not regulated under Section 10 of the RHA.

Vegetation within the ordinary high-water portion of the stream is dominated by mule fat (*Baccharis salicifolia*; FAC). Individuals of arroyo willow (*Salix lasiolepis*; FACW) and sandbar

willow (*Salix exigua*; FACW) are present along the upper edges of the OHWM. Vegetation between the OHWM and top-of-bank is a mix of shrubs and trees, including Oregon ash (*Fraxinus latifolia*; FACW), cottonwood (*Populus fremontii*; FAC), willows (*Salix* spp.), mule fat (FAC), Himalayan blackberry (*Rubus armeniacus*; FAC), and California wild grape (*Vitis californica*; FACU).

Indicators of flow used to delineate the OHWM include shelving, scour, and shift in vegetation density and species.

Water regime of the stream was likely perennial in the past; however, due to regular extreme drought conditions, in the past few years, no flow has been present during the driest portions of the year. During the time between 2019 and 2022, pioneer perennial plants, primarily mule fat, have rapidly invaded the stream channel due to the reduction in flow.

Intermittent stream is classified as R4SB7J: Riverine (R), intermittent (4), streambed (SB), vegetated (7) intermittently flooded (J).

5.3 Features Determined Exempt

No features are determined to be exempt from Corps or RWQCB jurisdiction.

6 CONCLUSION

The results of this delineation of aquatic resources were based on conditions observed during the time of the assessment. The delineation uses the federal methodology to determine the potential boundaries of wetlands and non-wetland features (Corps. 1987) and is consistent with the approach used by the RWQCB to determine wetlands subject to the State Wetland Policy (SWRCB 2019).

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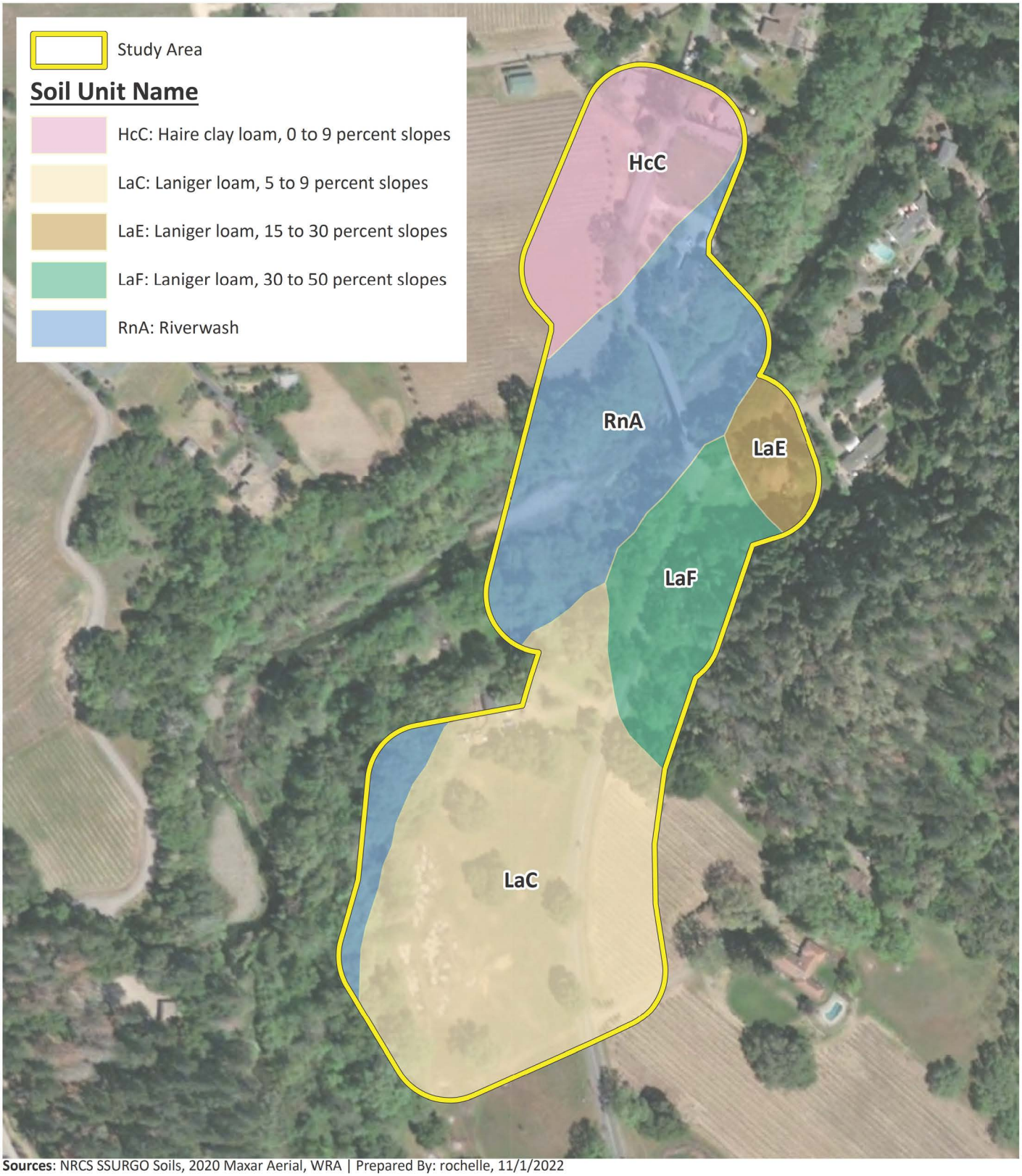
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Xrite 2013	Munsell Soil Color Chart

APPENDIX A. FIGURES


Study Area
Healdsburg
Windsor
Foothill Regional Park
Russian River
Maacama Creek
Mill Creek
Dry Creek
Brooks Creek
Barnes Creek
Pool Creek
Alexander Valley Rd
W Soda Rock Ln
Foppiano Rd
Lytton Station Rd
Limerick Ln
Milk Barn Rd
Los Amigos Rd
Windsor River Rd
Pleasant Ave
Mack Rd
Shiloh Rdg
Thomas Rd
Tremonte Ln
Hoot Owl Creek
Batts Rd
Grant Ave
Bailhache Ave
Foothill Dr
Start Rd
Hillview Rd
Brooks Rd
Chalk Hill Rd
Leslie Rd
Jensen Ln
Mitchell Ln
Lockwood Dr
Mayacama Club Dr
Shiloh Rd
Gruenhagen Rd
Cook Ln
Indian Ln
Coof Way
Murphy Rd
Ahgray Rd
Terra Rossa Ln
Briggs Ranch Rd
Walters Rd
Machado Rd
Castelli Ln
Fitts Rd
Sausal Creek
W Sausal Ln
Lytton Creek
Hessingpaugh Ave
Shannon Rd
Passalacqua Rd
Rio Lindo Ave
Toyon Dr
Piper St
Rosa Loop Dr
Chiquita Rd
Norton Rd
Pozzan Rd
West Slough
Grove St
Johnson St
College St
Mill St
Kennedy Ln
Foppiano Rd
N Fitch Mountain Rd
Healdsburg Ave
Limerick Ln
Milk Barn Rd
Los Amigos Rd
Windsor River Rd
Start Rd
Hillview Rd
Brooks Rd
Chalk Hill Rd
Foothill Dr
Foothill Regional Park
Mack Rd
Leslie Rd
Jensen Ln
Mitchell Ln
Lockwood Dr
Mayacama Club Dr
Shiloh Rdg



Path: L:\Acad 2000 Files\27000\27316\GIS\ArcMap\Delineation\27316-Delineation\27316-Delineation.aprx

Sources: NRCS SSURGO Soils, 2020 Maxar Aerial, WRA | Prepared By: rochelle, 11/1/2022

Figure 2. Soils Map

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

0 250 500 Feet

N

wra
ENVIRONMENTAL CONSULTANTS



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Sources: USGS Topo Quad, WRA | Prepared By: rochelle, 11/1/2022

Figure 3. USGS Topographic Map

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

0 500 1,000 Feet

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ENVIRONMENTAL CONSULTANTS

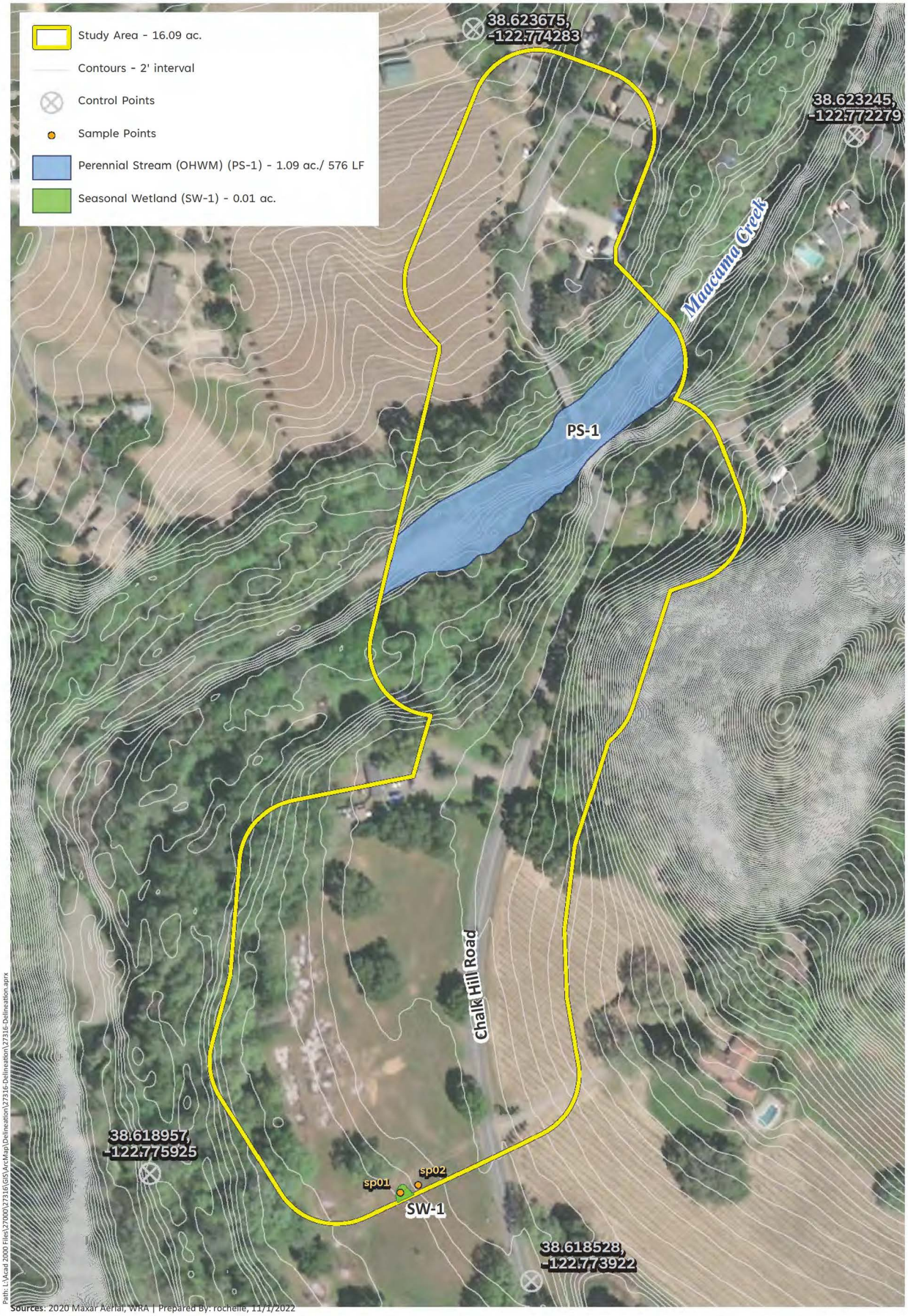


Figure 4. Potential Corps Jurisdiction

Chalk Hill Road Over Maacama Creek
Bridge Replacement Project
Sonoma County, California

0 200 400 Feet

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APPENDIX B. WETLAND DETERMINATION DATA FORMS

Wetland Determination Data Form - Arid West Region

Project/Site: Chalk Hill Road Bridge Replacement | City: Unincorporated | County: Sonoma | Sampling Date: 6/6/2019

Applicant/Owne: CalTrans | State: CA | Sampling Point: **SP-01**

Investigator(s): R. Korhummel | Section,Township,Range:

Landform (hillslope, terrace, etc: terrace | cal Relief (concave, convex, none): flat | Slope(%): 0-4

Subregion(LRR): LRR C (Medit. CA) | Lat: 38.618887 | Long: -122.774614 | Datum: WGS 84

Soil Map Unit Name: Langier loam, 5 to 9 percent slope | NWI classification: none

Are climatic/hydrologic conditions on-site typical for this time of ye: ☒ Yes ☐ No (If no, explain in remarks

Are any of the following significantly disturbe: ☐ Vegetatio ☐ Soil ☐ Hydrolog re "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problemat: ☐ Vegetatio ☐ Soil ☒ Hydrolog (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☒ Yes ☐ No
Hydric Soil Present? ☒ Yes ☐ No
Wetland Hydrology Present? ☒ Yes ☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: The sample point is located within a wetland swale at the base of a small slope. Hydrophytic vegetation and hydric soil were observed. Indicators of hydrology were not observed and is considered natrually problematic. Hydrology is presumed to be present due to presence of other two indicators.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: -	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: -			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5'x5'			
1. *Festuca perennis*	90	x	FAC
2. *Briza minor*	10		FAC
3. *Juncus effusus*	t		FACW
4. *Parentucellia viscosa*	t		FAC
5. *Lythrum hyssopifolia*	t		OBL
6. *Geranium dissectum*	t		UPL
7. *Bromus hordeaceus*	t		FACU
8. *Dipsacus sativus*	t		UPL
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: -			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: % cover of biotic crust:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 1 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 100 (A/B)

Prevalence Index Worksheet

Total % cover of		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Vegetation meets dominance test; hydrophytic vegetation is present. A distinct shift in vegetation between wetland and uplands was observed.

SOIL

Sampling Point SP-01

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[1]	Texture	Remarks
0-2	10YR 2/2	100					sandy loam	
2-7	10YR 3/2	95	7.5YR 3/4	5	C	PL	sandy loam	Redox distinct
7-11	10YR 3/2	80					sandy loam	
	10YR 3/3	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon
- ☐ Black Histic
- ☐ Hydrogen Sulfide
- ☐ Stratified Layers (A5)(LRR
- ☐ 1cm Muck (A9)(LRR
- ☐ Depleted Below Dark Surface
- ☐ Thick Dark Surface
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix
- ☐ Sandy Redox
- ☐ Stripped Matrix
- ☐ Loamy Mucky Mineral
- ☐ Loamy Gleyed Matrix
- ☐ Depleted Matrix
- ☒ Redox Dark Surface
- ☐ Depleted Dark Surface
- ☐ Redox Depressions
- ☐ Vernal Pools

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR
- ☐ 2cm Muck (A10)(LRR
- ☐ Reduced Vertic
- ☐ Red Parent Material
- ☐ Other (explain in

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present ? ☒ Yes ☐ No

Remarks: Soils meet Redox Dark Surface (F6) hydric soil indicator. Hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water
- ☐ High Water Table
- ☐ Saturation
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Surface Soil Cracks
- ☐ Inundation Visible on Aerial Imagery
- ☐ Water-Stained Leaves
- ☐ Salt Crust
- ☐ Biotic Crust
- ☐ Aquatic Invertebrates
- ☐ Hydrogen Sulfide Odor
- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Presence of Reduced Iron
- ☐ Recent Iron Reduction in PLowed Soils
- ☒ Other (Explain in

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Drainage Patterns
- ☐ Dry-Season Water Table
- ☐ Thin Muck Surface
- ☐ Crayfish Burrows
- ☐ Saturation Visible on Aerial Imagery
- ☐ Shallow Aquitard
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☐ Yes	☒ No	Depth (inches): _____
Water table present?	☐ Yes	☒ No	Depth (inches): _____
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (inches): _____

Wetland Hydrology Present ? ☒ Yes ☐ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology were observed; however hydrology is presumed present as the feature is located in a topographic swale at the base of a small slope and is likely to collect water and hydrophytic vegetation and hydric soils were observed.

Wetland Determination Data Form - Arid West Region

Project/Site: Chalk Hill Road Bridge Replacement | City: Unincorporated | County: Sonoma | Sampling Date: 6/6/2019

Applicant/Owner: CalTrans | State: CA | Sampling Point: **SP-02**

Investigator(s): R. Korhummel | Section,Township,Range:

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): flat | Slope(%): 0-4

Subregion(LRR): LRR C (Medit. CA) | Lat: 38.618919 | Long: -122.774521 | Datum: WGS 84

Soil Map Unit Name: Langier loam, 5 to 9 percent slope | NWI classification: none

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetatio ☐ Soil ☐ Hydrolog | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetatio ☐ Soil ☐ Hydrolog | (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☐ Yes ☒ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: Sample point is upland pair point to SP-01. No indicators of wetland observed.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** -	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** -			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5'x5'			
1. *Avena barbata*	65	x	UPL
2. *Chlorogalum pomeridianum*	12		UPL
3. *Stipa pulchra*	10		UPL
4. *Festuca perennis*	10		FAC
5. *Bromus hordeaceus*	3		FACU
6. *Brodiaea elegans*	1		FACU
7. *Torilis arvensis*	t		UPL
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM **Plot Size:** -			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: | % cover of biotic crust:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC? 0 (A)

Total number of dominant species across all strata? 1 (B)

% of dominant species that are OBL, FACW, or FAC? 0 (A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: No indicator of hydrophytic vegetation was observed.

SOIL

Sampling Point SP-02

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 3/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon
- ☐ Black Histic
- ☐ Hydrogen Sulfide
- ☐ Stratified Layers (A5)(LRR
- ☐ 1cm Muck (A9)(LRR
- ☐ Depleted Below Dark Surface
- ☐ Thick Dark Surface
- ☐ Sandy Mucky Mineral
- ☐ Sandy Gleyed Matrix
- ☐ Sandy Redox
- ☐ Stripped Matrix
- ☐ Loamy Mucky Mineral
- ☐ Loamy Gleyed Matrix
- ☐ Depleted Matrix
- ☐ Redox Dark Surface
- ☐ Depleted Dark Surface
- ☐ Redox Depressions
- ☐ Vernal Pools

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR
- ☐ 2cm Muck (A10)(LRR
- ☐ Reduced Vertic
- ☐ Red Parent Material
- ☐ Other (explain in

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: abundant pebbles

Depth (inches): 4

Hydric Soil Present ? ☐ Yes ☒ No

Remarks: No indicators of hydric soils observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water
- ☐ High Water Table
- ☐ Saturation
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Surface Soil Cracks
- ☐ Inundation Visible on Aerial Imagery
- ☐ Water-Stained Leaves
- ☐ Salt Crust
- ☐ Biotic Crust
- ☐ Aquatic Invertebrates
- ☐ Hydrogen Sulfide Odor
- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Presence of Reduced Iron
- ☐ Recent Iron Reduction in PLowed Soils
- ☐ Other (Explain in

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Drainage Patterns
- ☐ Dry-Season Water Table
- ☐ Thin Muck Surface
- ☐ Crayfish Burrows
- ☐ Saturation Visible on Aerial Imagery
- ☐ Shallow Aquitard
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): _____

Water table present? ☐ Yes ☒ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): _____

Wetland Hydrology Present ? ☐ Yes ☒ No

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: No indicators of hydrology were observed.

APPENDIX C. STUDY AREA PHOTOGRAPHS



Photo 1. Looking downstream in the stream channel on the western side of Chalk Hill Road Bridge. Photo taken June 6, 2019.



Photo 2. Looking across the stream channel to the northern bank on the eastern side of Chalk Hill Road bridge. Photo taken June 6, 2019.



Photo 3. Looking across the stream channel to the southern banks of the western side of Chalk Hill Road bridge. Photo taken June 6, 2019.



Photo 4. Looking along the southern banks of the eastern side of Chalk Hill Road bridge. Photo taken June 6, 2019.



Photo 5. Seasonal wetland within Study Area. Photo taken June 6, 2019.



Photo 6. Hydric soils observed within the seasonal wetland. Photo taken June 6, 2019.



Photo 7. Looking downstream from Chalk Hill Road bridge. Photo taken October 27, 2022.



Photo 8. Looking upstream from Chalk Hill Road bridge. Photo taken October 27, 2022.

APPENDIX D. OBSERVED PLANT SPECIES LIST

Appendix D. Plant Species Observed within the Study Area on June 6, 2019

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status (AW 2020)[3]
Aesculus californica	Buckeye	native	tree	-	-	-
Alnus rubra	Red alder	native	tree, shrub	-	-	FACW
Arbutus menziesii	Madrone	native	tree	-	-	-
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Baccharis pilularis	Coyote brush	native	shrub	-	-	-
Baccharis salicifolia ssp. *salicifolia*	Mule fat	native	shrub	-	-	FAC
Briza maxima	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited	-
Briza minor	Little rattlesnake grass	non-native	annual grass	-	-	FAC
Brodiaea elegans ssp. *elegans*	Harvest brodiaea	native	perennial herb	-	-	FACU
Bromus caroli-henrici	Weedy brome	non-native	annual grass	-	-	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Bromus hordeaceus	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-
Carex obnupta	Slough sedge	native	perennial grasslike herb	-	-	OBL

Appendix D. Plant Species Observed within the Study Area on June 6, 2019

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status (AW 2020)[3]
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-
Centromadia fitchii	Spikeweed	native	annual herb	-	-	FACU
Chlorogalum pomeridianum	Amole	native	perennial herb	-	-	-
Cichorium intybus	Chicory	non-native	perennial herb	-	-	FACU
Conium maculatum	Poison hemlock	non-native (invasive)	perennial herb	-	Moderate	FACW
Convolvulus arvensis	Field bindweed	non-native	perennial herb, vine	-	-	-
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-
Cynosurus echinatus	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-
Danthonia californica	California oatgrass	native	perennial grass	-	-	FAC
Dipsacus sativus	Indian teasel	non-native (invasive)	biennial herb	-	Moderate	-
Dittrichia graveolens	Stinkwort	non-native (invasive)	annual herb	-	Moderate	-
Elymus caput-medusae	Medusa head	non-native (invasive)	annual grass	-	High	-
Elymus glaucus	Blue wildrye	native	perennial grass	-	-	FACU
Epilobium brachycarpum	Willow herb	native	annual herb	-	-	FAC

Appendix D. Plant Species Observed within the Study Area on June 6, 2019

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status (AW 2020)[3]
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC
Foeniculum vulgare	Fennel	non-native (invasive)	perennial herb	-	High	-
Fraxinus latifolia	Oregon ash	native	tree	-	-	FACW
Geranium dissectum	Wild geranium	non-native (invasive)	annual herb	-	Limited	-
Geranium molle	Crane's bill geranium	non-native	annual, perennial herb	-	-	-
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
Hordeum murinum	Foxtail barley	non-native (invasive)	annual grass	-	Moderate	FACU
Juglans hindsii	Northern California black walnut	native	tree	-	-	FAC
Juncus effusus	Common bog rush	native	perennial grasslike herb	-	-	FACW
Lathyrus hirsutus	Caley pea	non-native	annual herb	-	-	FAC
Lupinus nanus	Sky lupine	native	annual herb	-	-	-
Lysimachia arvensis	Scarlet pimpernel	non-native	annual herb	-	-	FAC
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL

Appendix D. Plant Species Observed within the Study Area on June 6, 2019

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status (AW 2020)[3]
Medicago polymorpha	Bur clover	non-native (invasive)	annual herb	-	Limited	FACU
Melica torreyana	Torrey's melica	native	perennial grass	-	-	-
Parentucellia viscosa	Yellow glandweed	non-native (invasive)	annual herb	-	Limited	FAC
Phytolacca americana var. *americana*	American pokeweed	non-native	perennial herb	-	Limited	FAC
Pinus attenuata	Knobcone pine	native	tree	-	-	-
Pinus longaeva	Bristlecone pine	native	tree	Rank 4.3	-	-
Populus fremontii ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC
Quercus agrifolia	Coast live oak	native	tree	-	-	-
Quercus douglasii	Blue oak	native	tree	-	-	-
Quercus lobata	Valley oak	native	tree	-	-	FACU
Rosa nutkana	Nootka rose	native	shrub	-	-	FACU
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC
Rumex acetosella	Sheep sorrel	non-native (invasive)	perennial herb	-	Moderate	FACU
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC
Salix exigua	Narrowleaf willow	native	tree, shrub	-	-	FACW

Appendix D. Plant Species Observed within the Study Area on June 6, 2019

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status (AW 2020)[3]
Salix laevigata	Red willow	native	tree	-	-	FACW
Salix lasiolepis	Arroyo willow	native	tree, shrub	-	-	FACW
Sidalcea diploscypha	Fringed checker mallow	native	annual herb	-	-	-
Sonchus asper ssp. *asper*	Prickly sow thistle	non-native	annual herb	-	-	FAC
Sonchus oleraceus	Common sow thistle	non-native	annual herb	-	-	UPL
Stipa pulchra	Purple needle grass	native	perennial grass	-	-	-
Symphoricarpos albus var. *laevigatus*	Common snowberry	native	shrub	-	-	FACU
Torilis arvensis	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate	-
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU
Trifolium hirtum	Rose clover	non-native (invasive)	annual herb	-	Limited	-
Trifolium subterraneum	Subterranean clover	non-native	annual herb	-	-	-
Typha sp.	Cattail	Native	perennial herb	-	-	OBL
Umbellularia californica	California bay	native	tree	-	-	FAC
Verbascum thapsus	Woolly mullein	non-native (invasive)	perennial herb	-	Limited	FACU

Appendix D. Plant Species Observed within the Study Area on June 6, 2019

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status (AW 2020)[3]
Veronica anagallis-aquatica	Water speedwell	non-native	perennial herb	-	-	OBL
Vinca major	Vinca	non-native (invasive)	perennial herb	-	Moderate	-
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU
Vitis vinifera	Cultivated grape	non-native	vine, shrub	-	-	-
Xanthium strumarium	Cocklebur	native	annual herb	-	-	FAC

Note: All species identified using the *Jepson eFlora* [Jepson Flora Project (eds.) 2022; nomenclature follows *Jepson eFlora* [Jepson Flora Project (eds.) 2022 or Inventory of Rare and Endangered Plants (CNPS 2022). Sp.: "species", intended to indicate that the observer was confident in the identity of the genus but uncertain which species.

[1] **California Native Plant Society. Inventory of Rare and Endangered Plants (online edition). Sacramento, California.**

FE:	Federal Endangered
FT:	Federal Threatened
SE:	State Endangered
ST:	State Threatened
SR:	State Rare
Rank 1A:	Plants presumed extinct in California
Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere
Rank 2:	Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3:	Plants about which we need more information – a review list
Rank 4:	Plants of limited distribution – a watch list

[2] **California Invasive Plant Council. 2022. California Invasive Plant Inventory Database. California Invasive Plant Council, Berkeley, CA.**

High:	Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
Moderate:	Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited-moderate distribution ecologically
Limited:	Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed:	Assessed by Cal-IPC and determined to not be an existing current threat

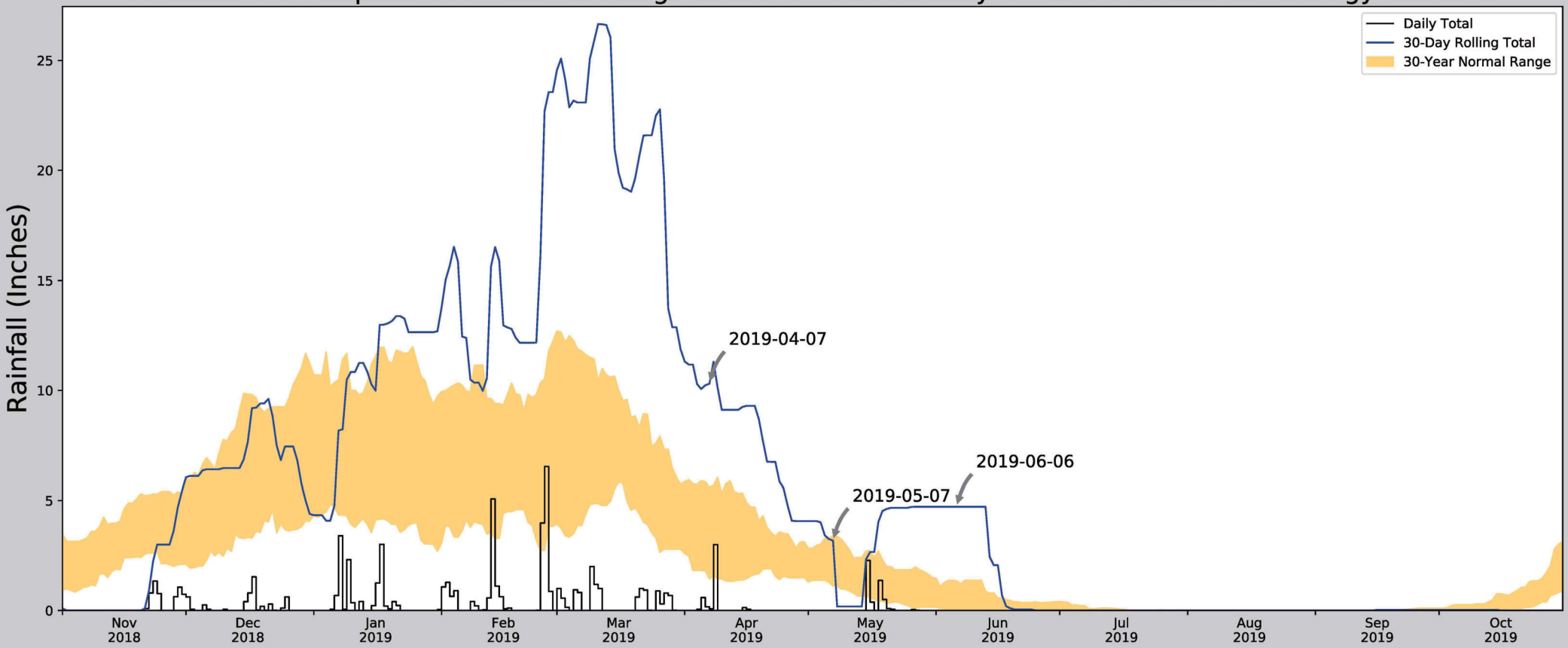
Appendix D. Plant Species Observed within the Study Area on June 6, 2019

[3] **U.S. Army Corps of Engineers. 2020. National Wetland Plant List, version 3.5. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH. Online at: http://wetland-plants.usace.army.mil/**

OBL:	Almost always found in wetlands
FACW:	Usually found in wetlands
FAC:	Equally found in wetlands and uplands
FACU:	Usually not found in wetlands
UPL:	Almost never found in wetlands
NL:	Not listed, assumed almost never found in wetlands
NI:	No information; not factored during wetland delineation

APPENDIX E. ANTECEDENT PRECIPITATION TOOL ANALYSIS

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	38.618869, -122.774590
Observation Date	2019-06-06
Elevation (ft)	169.63
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2019-06-06	0.027953	1.348425	4.72441	Wet	3	3	9
2019-05-07	1.115354	3.383071	3.181102	Normal	2	2	4
2019-04-07	1.438189	5.597638	10.30315	Wet	3	1	3
Result							Wetter than Normal - 16

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HEALDSBURG	38.6294, -122.8664	176.837	5.009	7.207	2.29	8950	83
HEALDSBURG #2	38.6333, -122.8667	149.934	0.27	26.903	0.129	2	0
HEALDSBURG 0.7 NE	38.6259, -122.855	337.927	0.661	161.09	0.404	3	1
HEALDSBURG 0.6 W	38.6179, -122.8731	104.987	0.873	71.85	0.456	105	0
HEALDSBURG 2.9 N	38.6605, -122.8639	176.837	2.153	0.0	0.969	343	0
HEALDSBURG 3.7 WNW	38.6476, -122.9207	142.06	3.189	34.777	1.546	1239	6
HEALDSBURG 4.2 NW	38.6564, -122.923	154.856	3.579	21.981	1.689	2	0
WINDSOR 1.2 NNW	38.5617, -122.8055	154.856	5.718	21.981	2.699	50	0
WINDSOR 1.5 WNW	38.5551, -122.8227	123.031	5.65	53.806	2.847	22	0
WINDSOR 0.6 NNE	38.5534, -122.7929	157.152	6.583	19.685	3.092	518	0
HEALDSBURG 7.5 NW	38.6934, -122.9627	203.084	6.823	26.247	3.249	1	0
WINDSOR 1.4 SE	38.5317, -122.78	140.092	8.206	36.745	3.994	8	0
WARM SPRINGS DAM	38.7161, -122.9975	224.081	9.268	47.244	4.608	2	0
SANTA ROSA SONOMA CO AP	38.5039, -122.8103	113.845	9.186	62.992	4.712	108	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Appendix H – Preparers' Qualifications

Eliza Schlein

Biologist

Eliza Schlein is a multi-disciplinary biologist with experience in environmental restoration, marine biology, and wildlife ecology. Eliza completed her Bachelors of Science degree in Environmental Sciences at the University of Virginia where she focused on restoration ecology and biological conservation. She continued her education at Northeastern University where she obtained a Master of Science degree in Marine Biology. Eliza has conducted field work in the San Francisco Bay Area, New England, Coastal North Carolina, Panama, and the San Juan Islands working with marine megafauna, oysters, coral reefs, and invasive plants.

As a consulting Biologist for WRA, Eliza conducts biological surveys, construction monitoring, and fish salvage operations. When not conducting fieldwork, Eliza assists with drafting technical reports and preparing regulatory permit applications. She has experience creating fish rescue and relocation plans, CEQA documents, Notifications of Lake or Streambed Alteration, and Pre-construction Notifications for Clean Water Act Nationwide Permits. Eliza has experience handling California red-legged frogs and Chinook salmon, as well as numerous common freshwater and Bay fish species.



Years of Experience

3

Education

M.S., Marine Biology, Northeastern University

B.S., Environmental Sciences, University of Virginia

Professional Certifications

AAUS Scientific Diver, 2017

CPR/First Aid Certification, 2017

Specialized Training

Alameda Whipsnake Training, WRA, Inc. 2020

FEMA Incident Command 100 and 200, FEMA Emergency Management Institute, 2015

Relevant Project Experience

Biological Monitoring

Stream Maintenance Program, City of Livermore, Alameda County, California

Biological Monitor

WRA provides permit compliance and mitigation services to the City of Livermore for the implementation of their Stream Maintenance Program (SMP). This includes interpretation of permit requirements, biological and water quality monitoring during construction, mitigation design services, and long-range mitigation planning. Eliza served as a biological monitor during construction of storm damage repairs and habitat restoration at multiple sites. The project had potential to impact California red-legged frog, California tiger salamander and several other special-status species. When on site, Eliza ensured that project activities were performed in compliance with permits and that mitigation measures were properly implemented. Daily tasks included, conducting worker environmental educational programs, pre-construction surveys, construction monitoring, interacting with an interested public, and daily reporting.

Treasure Island/Yerba Buena Island Redevelopment, Power Engineering, San Francisco, California

Biological Monitor- Marine Mammals

This project involves the conversion of 460-acres of the former Naval Base Treasure Island to mixed-use development, a ferry terminal, parks, and open space sponsored by the City of San Francisco and a consortium of private developers. It is one of the largest and most visible projects in the San Francisco Bay Area in the last 30 years. The project requires shoreline improvements and construction of a new ferry terminal located within an existing Anchorage Zone

designated by the U.S. Coast Guard. In accordance with project minimization measures, Eliza monitored in-water pile driving to ensure no marine mammals were negatively impacted.

Austin Quarry, Confidential Client, Madera County, California
Biological Monito/Permitting Specialist
The client is developing a 348-acre hard-rock mine and processing plant within an existing vernal pool complex north of the Fresno, in Madera County. The quarry will operate for approximately 100-years. The project also includes preservation and entitlement of a 765-acre Conservation Easement on an adjacent property. WRA negotiated the issuance of the project's environmental permits, including development of a Long-Term Management Plan for the mitigation preserve, and several subsequent permit amendments. Eliza assisted with drafting a Notification of Lake or Streambed Alteration for culvert upgrades and has excavated gopher and ground squirrel burrows to look for California tiger salamander (CTS) under the observation of a USFWS- and CDFW-approved Designated Biologist.

Pilarcitos Quarry Expansion and Water Resources Project, Confidential Client, San Mateo County, California
Biological Monitor
Pilarcitos Quarry is an aggregate mining facility located east of the town of Half Moon Bay in rural San Mateo County. As part of the planned expansion and ongoing operations, and in compliance with a U.S. Fish and Wildlife Service (USFWS) Biological Opinion, the quarry owner placed a conservation easement on 192.5 acres of the property, and constructed two mitigation ponds to provide habitat for federal-listed California red-legged frog (CRLF) and San Francisco garter snake (SFGS). Eliza assists WRA's senior wildlife biologists in identifying CRLF during seasonal capture and relocation efforts; to date she has handled 15 individuals. Eliza also supports WRA's annual invasive plant infestation mapping and plays a large role in authoring Annual Monitoring Reports for these tasks.

Airport Road Business Center, Private Client, Santa Rosa, California
Biological Monitor
The Airport Road Business Center complex is being constructed to allow for more business growth. In order to maintain roadway connectivity and ensure continued drainage function, Airport Boulevard was widened, stormwater features were constructed, and nearby riparian habitats were restored. Eliza ensured that project activities were performed in compliance with permits and that mitigation measures were properly implemented.

Springtown Mitigation Project Construction Oversight, Carl Zeiss, Inc., Dublin, California
Biological Monitor
The new Zeiss Innovation Center will consist of research and development space, offices, parking, and associated infrastructure. WRA is the project biological consultant, responsible for CEQA biological surveys, environmental permitting, and mitigation planning for the project. The project encroaches on a sensitive wetland area that must be protected to comply with U.S. Army Corps of Engineers (Corps) regulations. Eliza monitored construction activities to ensure that the protected wetland was not disturbed.

Loch Lomond Marina Mitigation, Monitoring and Reporting, Private Client, San Rafael, California
Biological Monitor
This residential and public park redevelopment project located on San Francisco Bay and adjacent to the Loch Lomond Marina includes residential redevelopment, Marin Breakwater refit, an East Spit parking lot and public playground, a public access Breakwater Trail, kayak launch, and tidal wetland restoration. WRA is responsible for developing and executing the Habitat Mitigation and Monitoring Plan for the tidal restoration at the East Spit, and to mitigate for removal of remnant swales, WRA designed a tidal wetland restoration to expand the existing tidal wetlands on site. Mitigation wetlands were constructed at Loch Lomond Marina to compensate for wetlands lost during construction of buildings, homes, and offices associated with marina use. Eliza has conducted vegetation and hydrology monitoring at the site to ensure that the mitigation wetlands are functioning as designed. She has assisted with data analysis and annual monitoring reports for the project.

Mare Island Shipyard Dry Dock Fish Monitoring and Salvage, Mare Island Dry Docks, LLC, Vallejo, California
Biological Monitor
Both government and private ships needing repair are brought to the dry docks at the former Mare Island Naval Shipyard. In accordance with permit requirements by the USFWS, NMFS, and CDFW, biologists are required to be

present during final stages of dewatering to salvage (rescue) stranded fish from the dry dock. Captured fish are placed in aerated holding coolers, identified to species, enumerated and measured before being returned to the Mare Island Channel of the Napa River. Eliza performs fish salvage operations for this ongoing project.

McClellan Ranch Preserve Community Garden and West Parking Area, City of Cupertino, Santa Clara County, California

Biological Monitor

The City of Cupertino refurbished a community garden and constructed an overflow parking area at the McClellan Ranch Preserve, which provides open space habitat for many special-status species. Part of the project followed the edge of the Stevens Creek riparian corridor at the Preserve, and the City had applied for a Lake and Streambed Alteration Agreement (LSAA) from California Department of Fish and Wildlife. WRA was retained after the City had applied for the LSAA. Eliza is responsible for annual monitoring of the mitigation area and preparation of the monitoring report.

Bon Air Bridge Replacement, City of Larkspur, Larkspur, California

Biological Monitor – Marine Mammals

Bon Air Bridge spans Corte Madera Creek, a highly sensitive tidal channel that drains to the San Francisco Bay, and provides an important link between Larkspur and adjacent communities. The bridge is being replaced by a new bridge, correcting structural deficiencies to provide a stable and safe structure. WRA is responsible for biological services throughout the pre- and construction phases of the project. In compliance with the project's environmental permits and approvals, Eliza has monitored in-water construction activities to ensure that there are no adverse impacts to marine mammals, predominantly pinnipeds.

Marin Lagoon Fish Study, Marin Lagoon Homeowner's Association, Marin County, California

Biological Monitor

The Marin Lagoon is an artificial lagoon, lined and maintained for aesthetic purposes, which is also tidally connected to San Pablo Bay. Through a series of assessments which collect data on water quality and Environmental DNA, a study to determine potential effects of the project on EFH was designed to track target fish species potential presence and identify parameters of the project to alter to make operation of the artificial lagoon more fish friendly. Eliza has assisted in eDNA collection and water quality monitoring.

Military Ocean Terminal Concord Project (MOTCO), U.S. Army Corps of Engineers, Concord, California

Biological Monitor – Marine Mammals

MOTCO is a U.S. Army Base in Concord, California that is used to distribute surface cargo from storage and repair depots to military forward based units. There are numerous piers that allow the base to receive shipments from the San Francisco Bay. WRA preformed marine mammal surveys, as required by project permits in support of on-going operations. Surveys were conducted using visual survey techniques, and timed to account for tidally influenced fluctuations in marine mammal presence. Eliza collected marine mammal data on-site for four days of in-water work.

Environmental Permitting and Mitigation

Larkspur Extension Project Mitigation Support, Sonoma-Marin Area Rail Transit (SMART), Marin County, California

Biologist

SMART completed their 2-mile extension of passenger rail service between the City of San Rafael and the Larkspur Ferry Terminal in 2019. The environmental permits for constructing the extension included conditions for implementing mitigation to compensate for impacts to streams and wetlands. WRA is assisting with multiple tasks pertaining to mitigation compliance for the project. With SMART's engineers, Eliza conducted an inspection of mitigation areas located in San Rafael, and prepared a monitoring report and photo documentation that were submitted to the Corps, Water Board and CDFW to document completion of mitigation in the form of fill and debris removal from tidal creek channels adjacent to the railroad and non-motorized pathway. Eliza also assisted with development of a riparian enhancement plan that prescribes target species and methods for removing invasive plants and revegetating with native species.

Black Point Bridge Fender Repair Project, Sonoma-Marin Area Rail Transit (SMART), Marin County, California

Permitting Specialist

Black Point Bridge is a 100+ year old swing bridge that extends across the Petaluma River connecting Marin and Sonoma Counties, and was damaged by a vessel collision in 2018. WRA is supporting SMART with the necessary environmental clearances to complete repairs to the bridge fenders. This work includes preparation of a biological resource's evaluation and other documentation in support of a Categorical Exclusion from CEQA, as well as preparation of permit applications to state agencies. Eliza helped develop and write the project description used in permit applications and documentation of CEQA exemption; she is also preparing applications for permits from the San Francisco Bay Conservation and Development Commission (BCDC), California Department of Fish and Wildlife (CDFW) and San Francisco Bay Regional Water Quality Control Board (RWQCB).

California Environmental Quality Act (CEQA)

Off-Leash Dog Policy Pilot Project, County of San Mateo Parks Department, San Mateo County, California

Environmental Analyst

San Mateo County Parks is evaluating two of its parks for off-leash dog use, which include Quarry Park and Pillar Point Bluff Park. These parks provide refuge to a variety of native plants and animals in El Granada. As part of that evaluation, WRA is currently preparing an Adaptive Management Plan to evaluate the Pilot Program, which will be followed by an Initial Study/Mitigated Negative Declaration to support the effort and has prepared a whitepaper on environmental impacts of allowing off-leash dogs on trails. Eliza has been the main author of the document and contributed to research efforts leading to the development of an adaptive management plan.

East Palo Alto Water Transmission Lines Update, City of East Palo Alto Department of Public Works, San Mateo County, California

Environmental Analyst

The City of East Palo Alto has designed a water transmission line update in order to meet the needs of the expanding community. The current water transmission system is deteriorating and must be updated. However, the City does not have the funds to complete such a large-scale project. WRA drafted a grant proposal to obtain the funds from the U.S. Economic Development Administration (EDA). Eliza was the main author on the environmental narrative document which evaluates the impact the proposed project could have on the surrounding environment.

Eliza Schlein
Biologist

Experience Prior to WRA

Ocean Salmon Project Port Sampling, California Department of Fish and Wildlife, San Francisco, California (2018)

The Ocean Salmon Project is a long-running salmon monitoring project that collects catch data from commercial and recreational fishermen to monitor the health of the salmon fishery and help determine fishery policy. Eliza worked as a Port Sampler where she collected samples from tagged King Salmon landed at the Port of San Francisco. She identified various salmonid species encountered in the Bay Area and gathered survey information from the fishermen about catch effort. Eliza worked closely with CDFW officials to ensure compliance with recreational and commercial fishing statutes.

New River Oyster Highway, University of North Carolina – Chapel Hill Institute of Marine Sciences, Morehead City, North Carolina (2017)

UNC-Chapel Hill is providing scientific oversight of the City of Jacksonville's plan to restore oyster populations in the New River Estuary to improve water quality and promote commercial oyster harvesting. Eliza conducted an experiment examining oyster settlement on different substrates used to promote larval settlement and growth. She gained valuable insight into project and budget management strategies, experimental design, and coordination with public and private stakeholders.

Habitat Restoration Team, Golden Gate Parks Conservancy, Marin County, California (2015-2016)

The Golden Gate National Parks Conservancy in cooperation with the National Park Service leads an effort to restore the Marin Headlands to native habitat. While working on this team, Eliza developed, implemented, and coordinated restoration plans to combat expanding invasive plant populations. She conducted native and invasive plant identification, invasive plant removal, native plant seed collection, vegetation monitoring, and native plant propagation. Eliza led weekly volunteer groups in conducting invasive plant removal fieldwork and documented project progress.

Erik Schmidt

Regulatory Permitting Specialist

Erik Schmidt is a Regulatory Permitting Specialist with WRA, Inc. He brings 20 years of conservation experience and specialized knowledge of programmatic and project-specific regulatory permitting for ecological restoration throughout California, primarily in aquatic and riparian habitats. He earned an MA degree in Public and Environmental Policy from the University of Colorado, Boulder and was a John Knauss National Sea Grant Fellow in Washington, DC following his graduate work.

With the nonprofit organization Sustainable Conservation, Erik spent nearly 12 years working closely with restoration proponents in all regions of the state, and with federal and state agencies, including NOAA Fisheries (NMFS), U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), California Coastal Commission, and State and Regional Water Boards to develop more efficient regulatory pathways for beneficial habitat and water quality projects. This innovative collaboration model led to the development of numerous advanced approvals for restoration and multi-benefit projects, including four NMFS programmatic Section 7 biological opinions, a Coastal Commission federal consistency determination approval for the state's entire Coastal Zone, and a new CDFW permit process -- the Habitat Restoration and Enhancement (HRE) Act. Erik's experience in finding common ground among diverse stakeholders and vision of what can be achieved through collaboration guide his approach to obtaining regulatory approvals and helping project applicants successfully plan, design and implement projects.

Relevant Project Experience

Upper York Creek Dam Removal and Ecosystem Restoration, City of St. Helena, Napa County, California

Permitting Specialist

This restoration and habitat enhancement project will remove a historic dam to restore natural geomorphic processes and habitat for federally threatened steelhead (Oncorhynchus mykiss) in York Creek, while protecting a county road and preventing adverse flooding in the City of St. Helena. The project involves a process-based restoration design that will notch the earthen dam and cut a pilot channel through the accumulated sediment. WRA provided final engineering design and regulatory agency permitting on an accelerated schedule due to funding requirements, as well as provided design oversight, compliance surveys, and biological monitoring during construction. Erik was a permitting specialist for the project and wrote a Biological Assessment for Sec. 7 consultation with National Marine Fisheries Service to ensure that project actions did not negatively affect a population of steelhead present on the site. Erik also wrote a narrative account of the complex dam removal project and its 20+ year history for WRA, providing technical information for a general audience.



Years of Experience

20

Education

M.A., Public and Environmental Policy, University of Colorado, Boulder

B.A., Cultural Anthropology, University of California, San Diego

Professional Affiliations

Salmonid Restoration Federation (SRF)

California Society for Ecological Restoration (SERCAL)

Specialized Training

Facilitation Skills for Science and Resource Managers

Collaboration Skills for Environmental Professionals

Managing Watersheds for Flood Control and Habitat Conservation

Hydrologic and Geomorphologic Processes in Stream Restoration

Engineering Innovative Fish Passage and Dam Removal

Streambed Alteration Agreements for Transportation Projects
Interagency Consultation for Endangered Species & Advanced Sec. 7

Lookout Slough Restoration Project, Ecosystems Investment Partners, Solano County, California

Permitting Specialist

This is an expansive, multi-benefit restoration project located in the North Delta's Cache Slough Complex. The state-funded work will restore over 3,300 acres of subtidal channels and tidal wetlands by breaching and relocating an U.S. Army Corps of Engineers (USACE) flood control levee. Benefiting numerous threatened and endangered species, including Delta smelt, Chinook salmon and steelhead, the project will also provide important improvements for regional flood capacity. WRA is providing restoration design services, complete baseline biological reports, regulatory permitting, and preparation of the appropriate California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents. Erik wrote the Delta Plan Consistency Determination, assisted on the Biological Assessment for NMFS, and reviewed the CDFW 2081 application. Erik also successfully planned for the project's use of the NOAA Restoration Center's Programmatic Biological Opinion (PBO) for Central Valley Restoration Projects, speeding NMFS approval.

San Dieguito Lagoon Wetlands Restoration Study, Silicon Valley Clean Water, San Diego County, California

Permitting Specialist

WRA conducted a feasibility study with an accompanying report, analyzing the potential for restoring three degraded coastal wetland sites in an important Southern California tidal habitat conservation area. Erik developed a strategy to reduce permitting time and costs and improve grant prospects for the future project, working with WRA design staff to shape concepts that can utilize state and federal programmatic permits. Permits include CDFW's HRE Act 1653, CWA 404 Nationwide/401 General Order, Coastal Commission CD, NMFS PBO) for qualified activities.

Bolinas Wye Wetlands Resiliency Project, County of Marin Open Space District, Marin County, California

Permitting Specialist

The project focuses on restoring Lewis Gulch Creek and the Wye Wetlands area at the northern tip of the Bolinas lagoon. Goals for this grant funded project are to connect Lewis Gulch Creek to its floodplain and restore the functions of the historic alluvial fan, enhance fish passage for federally threatened steelhead (Oncorhynchus mykiss), and to improve traffic safety on SR 1 at the intersection of Olema Bolinas Road. Erik wrote a Biological Assessment for Sec. 7 Consultation with NMFS, partnering with the NOAA Restoration Center for use of its restoration PBO and federal consistency determination with the Coastal Commission for beneficial habitat projects in the Coastal Zone.

Burlingame Stream Maintenance Program, City of Burlingame, Burlingame, California

Permitting Specialist

A total of five streams are included in the Burlingame Stream Maintenance Program (SMP), and maintenance activities include sediment, vegetation, and debris removal and vegetation trimming to alleviate restricted flows and associated flooding. Erik prepared the request for concurrence for NMFS and reviewed the USFWS request for concurrence for a new multi-year NWP. Both Services concurred with WRA's determination that the SMP is Not Likely to Adversely Affect listed species within minimal questions. A Section 404 NWP permit was received and permits are valid through 2022 when the current NWPs expire.

Butte Sink Mitigation Bank, Colusa County, California

Permitting Specialist

The Butte Sink Mitigation Bank is a 330-acre mix of agriculture and riparian habitat in Colusa County. The site is located along the western bank of Butte Creek, at the terminus of the Colusa Bypass, which diverts high flows from the Sacramento River into the site. The project is designed to create, restore, and preserve a mix of riparian, wetland, and floodplain habitat. Target species for the bank include protected salmonid species that occur in the Sacramento River and Butte Creek, including spring- and winter-run Chinook salmon and steelhead. WRA is leading the effort to develop the conservation bank, which includes concept design, baseline biological surveys, habitat evaluation, prospectus development, and permitting. Erik wrote Biological Assessments for Sec. 7 Consultation with NMFS and USFWS, and proposed partnering with the NOAA Restoration Center for use of its restoration PBO for the project.

Austin Quarry, Confidential Client, Madera County, California
Permitting Specialist
The client is developing a 348-acre hard-rock mine and processing plant within an existing vernal pool complex north of the Fresno, in Madera County. The quarry will operate for approximately 100-years. The project also includes preservation and entitlement of a 765-acre Conservation Easement on an adjacent property. WRA negotiated the issuance of the project's environmental permits, including development of a Long-Term Management Plan for the mitigation preserve, and several subsequent permit amendments. Erik wrote an amended BO for submission to the Corps and USFWS, and an amended Incidental Take Permit application for CDFW Sec. 2081 approval, as well as a draft letter to CDFW proposing additional mitigation measures for the highway improvements.

Experience Prior to WRA

CDFW Habitat Restoration and Enhancement Act, 2015
Legislative Proponent
Erik and colleagues at Sustainable Conservation worked with the California legislature and CDFW leaders, as well as restoration proponents throughout the state, to craft a bill, AB 2193, signed by Gov. Brown in 2014 that created the groundbreaking Habitat and Restoration Enhancement (HRE) Act for efficient permitting of beneficial projects by CDFW. Under F&G Code Secs. 1652/1653, qualifying small-scale voluntary restoration projects can receive fast approval by CDFW, in lieu of the Sec. 1602 Lake and Streambed Alteration Agreement and Sec. 2081 CESA processes.

Proposal for USFWS Statewide Programmatic Sec. 7 Consultation for Aquatic Habitat Restoration Projects, California, 2017
Senior Regulatory Strategist
On behalf of the NOAA Restoration Center and Army Corps Regulatory Division in California, Erik researched, wrote and submitted to USFWS a memo proposing USFWS participation in a multi-agency federal and state initiative for efficient regulatory permitting of restoration and multi-benefit projects. The memo led to USFWS agreement to work with three federal agencies and Sustainable Conservation to develop a statewide programmatic biological opinion (PBO) for beneficial projects.

NOAA Restoration Center-California Coastal Commission Federal Consistency Determination, 2013/2016
Senior Regulatory Strategist
On behalf of the NOAA Restoration Center, Erik and colleagues at Sustainable Conservation completed and submitted to the Coastal Commission two separate federal consistency determination packages, in 2013 and 2016, under the Coastal Zone Management Act and Coastal Act. With the Commission's votes of approval, the consistency determination has provided more efficient permitting for many habitat, water quality and flow enhancement projects along the entire coast, replacing time-consuming project-by-project permitting through Local Coastal Programs (LCPs) or the Commission.

NOAA Restoration Center-California Coastal Commission Federal Consistency Determination Example Project: Green Gulch Creek Stream and Habitat Restoration, Green Gulch Zen Center, Marin County, California, 2014
Senior Regulatory Strategist
Restoration of a natural meandering stream and floodplain at the Green Gulch Zen Center benefited from the federal consistency determination for habitat projects in the Coastal Zone, which Erik was instrumental in helping develop. The Zen Center's desire to convert a concrete stream channel on the agricultural property back to its natural form, featuring riparian forest and complex habitat structure, provided crucial winter rearing areas for salmonids and improved summer baseflows for fish, red-legged frogs and other wildlife and supported the Center's mission of living and farming in harmony with nature.

Biological Assessment for Funding and Permitting of Restoration Projects within Watersheds of Santa Barbara, Ventura, Los Angeles, Orange and San Diego Counties, California, 2014
Senior Regulatory Strategist
Erik wrote the biological assessment submitted to NMFS for the programmatic biological opinion (PBO) to authorize restoration projects in coastal watersheds of Southern California. This effort was initiated after researching and

demonstrating the need for more efficient review and approval of steelhead habitat restoration projects by the Corps and NMFS in Southern California. The PBO was approved in 2015.

Upper Carpinteria Creek Fish Passage Project, South Coast Habitat Restoration, Santa Barbara County, California, 2015
Senior Regulatory Strategist
Erik helped the nonprofit applicant in Santa Barbara County produce a project description for this fish passage barrier removal and bridge installation project with sufficient technical detail to be approved, and helped CDFW staff understand the new HRE Act (F&G Code Sec. 1652/1653) process, leading to the very first project approval issued by CDFW under the HRE Act. The work restored access to more than a mile of high-quality habitat for endangered Southern California steelhead.

Professional Affiliations

Salmonid Restoration Federation (SRF)

Society for Ecological Restoration of California (SERCAL)

Special Recognition

NOAA Excellence in Habitat Restoration Award, 2018

NOAA National Sea Grant Knauss Fellowship in Coastal and Marine Policy, 1995

Selected Recent Presentations

Salmonid Restoration Federation Annual Conference, Fortuna, California, 2018
Improving Restoration Permitting: A New Multi-agency Initiative to Advance Projects Statewide

California Society for Ecological Restoration Annual Conference, Tahoe City, California, 2016
Improving Permitting and Funding for Voluntary Restoration Projects

Salmonid Restoration Federation Steelhead Summit, San Luis Obispo, California, 2016
Accelerating Steelhead Recovery Projects with Programmatic Permitting: *Planning for Successful Use of New Federal and State Approvals for Restoration*

California Association of Resource Conservation Districts Annual Conference, 2011-2014
Planning for and Successfully Using Programmatic Permits for Beneficial Projects

Rhiannon Korhummel

Plant Biologist

Rhiannon Korhummel has more than ten years of experience conducting various types of biological assessments, including protocol-level special-status plant surveys, vegetation classification and mapping, and environmentally sensitive habitat area (ESHA) assessments, and four years' experience conducting wetland delineations following USACE protocol. She also has experience performing biological monitoring as part of permit conditions. Rhiannon regularly performs plant and vegetation surveys and assessments independently, and as part of a larger team with specialization in the habitats of Mendocino, Lake, Humboldt, Napa, Marin, and Sonoma counties. She is a seasoned project manager, with a project focus in private development, coastal development, cannabis cultivation, and long-term management and monitoring plans.

Rhiannon holds a Bachelor of Science in Botany from Humboldt State University and Certificate in Natural History from College of the Redwoods. Her course work in botany focused on ecology, taxonomy, and floristics with special emphasis in the flora of Northern California. She served as a biology lab technician for Teresa Sholars with College of the Redwoods, Fort Bragg. She also served as a Teaching Assistant for plant taxonomy under Michael Mesler at Humboldt State where she collected for and taught about plant families in a lab setting to undergraduates.

Prior to joining WRA, Rhiannon conducted floristic surveys for timber companies throughout the North Coast. She collected vegetation plot data for the California Native Plant Society (CNPS) following the Releve and Rapid Assessment protocols. Additionally, as an environmental service intern for the California State Parks-Mendocino District, Rhiannon conducted floristic surveys, invasive species mapping and management, and other essential biological surveys and assessments in support of CEQA documentation for the restoration of Ten Mile Dunes, Mendocino County. She was also previously employed as a biologist by California Department of Fish and Wildlife, Northern Region.

Relevant Project Experience

Biological Assessments

Biological Assessments for Cannabis Cultivation Permits, Mainspring Consulting (Mendocino County), various Clients in Sonoma County

Project Manager and Biologist

Rhiannon conducted and managed over 50 biological resource assessments for Cannabis cultivators in Mendocino County which were used for CEQA compliance and Sensitive Species Habitat Review as part of permit package.

Rhiannon conducted and managed eight biological resource assessments for Cannabis cultivators in Sonoma County which were used to apply for Cannabis cultivation permits. Assessment followed the Sonoma County methods for Biological Assessments as outlined by the Agriculture Commission. Assessments included potential for special-status plants and wildlife and



Years of Experience

10

Education

B.S., Botany, Humboldt State University

Certificate in Natural History, College of the Redwoods

Specialized Training

Nationwide Permit Course, National Wetland Training Institute, 2017

Advanced Hydric Soils Training Wetland Training Institute, 2017

40-Hour Wetland Delineation Training Wetland Training Institute, 2016

Carex Workshop, Jepson Herbarium, 2016

CNPS, 2018

Brassicaceae Workshop, Jepson Herbarium 2016

CRAM Vernal Pool Training, CRAM, 2015

CNDDB Workshop, CDFW 2014

Vegetation Assessment Workshop, CNPS Symposium, 2012

Rare Plant Surveys Workshop, CNPS Symposium, 2009

CNPS Vegetation Protocol Workshop, 2009

wetland buffer quality. Results were presented in a report which was provided to the County as part of a permit package.

Biological Assessment, Borgo Placemaking, Mariposa County, California
Project Manager and Biologist
Rhiannon led the biological assessment field effort that covered 3,000 acres in Mariposa County. As Project Manager, Rhiannon was responsible for ensuring all field materials were accurately prepared and provided to field staff, determine routes in the field for best coverage in an efficient manner, manage data collected by all field staff, and provide guidance to field staff on data collection. The biological assessment included protocol-level special-status plant surveys, vegetation mapping, protocol-level wetland delineation, and wildlife assessment.

Biological Assessment, RES, Mendocino County, California
Task Manager and Biologist
Rhiannon led the biological assessment field effort that covered large parcels in coastal Mendocino County as part of a potential mitigation bank. As Task Manager, Rhiannon was responsible for ensuring all field materials were accurately prepared and provided to field staff, determine routes in the field for best coverage in an efficient manner, manage data collected by all field staff, and provide guidance to field staff on data collection. The biological assessment included protocol-level special-status plant surveys, vegetation mapping, protocol-level wetland delineation, and wildlife assessment.

Biological Site Assessment (BSA), Private Landowner, Marin County, California
Biologist
Rhiannon has written several Marin County BSA's following Marin County guidelines. Field work required for the BSA included conducting sensitive species and habitat surveys within Marin County. Biological communities surveyed include coast redwood forest, oak woodlands, bay forests, non-native grasslands, streams and creeks, seasonal wetlands, and ruderal areas.

Biological Resource Reconnaissance Surveys, Vineyard Developers, Napa County, California
Biologist
Rhiannon conducted ten separate surveys in Napa County for private landowners needing to obtain permits for vineyard development. Her responsibilities included conducting database searches prior to site visit, identifying all plant species observed at the sites, identifying potential wetlands and waters, determining if suitable habitat for special-status species was present at each site, mapping vegetation types, compiling information gathered during the site visits into a report which was submitted to the County. Biological communities surveyed included chaparral, scrub oak Rhiannon was Project Manager for two of the projects; duties required for this role included managing budgets, overseeing field efforts and report writing, and assuring the deliverable be provided in a timely manner.

Biological Resource Assessments, Marietta Vineyards, Mendocino County, California
Biologist
As part of a proposed parcel split, the county of Mendocino required Marietta Vineyards to have a biological resources assessment to determine special-status plant species locations as well as any sensitive natural communities. Rhiannon performed a late season protocol-level special-status plant survey and sensitive natural community mapping at the Marietta Vineyards, Hopland in Mendocino County. Through this project, Rhiannon observed over two hundred species native or naturalized to southern Mendocino County, and documented several natural communities including coast live oak woodland, box elder woodland, coyote brush scrub, blue fescue grassland, purple needlegrass grassland, and non-native grassland.

Special-Status Plant Surveys and Floristic Surveys

Langtry Farms, Special-Status Plant Survey and Vegetation Mapping, Lake County, California
Biologist
Rhiannon provided botanical technical support for a large-scale floristic and special status plant survey on the 2,497-acre Langtry Farms in Lake County. The surveys followed regulatory agency guidelines and were conducted throughout the growing season. Biological communities surveyed included grasslands, serpentine chaparral, serpentine grasslands, wetlands, streams and creeks, oak woodlands, and chaparral.

Lookout Slough, Special-Status Plant Surveys, Solano County, California
Biologist
This is an expansive, multi-benefit restoration project located in the North Delta's Cache Slough Complex. The state-funded work will restore approximately 3,165 acres of subtidal channels and tidal wetlands by breaching and relocating an U.S. Army Corps of Engineers (USACE) flood control levee. Benefiting numerous threatened and endangered species, including Delta smelt, Chinook salmon and steelhead, the project will also provide important improvements for regional flood capacity. WRA is providing restoration design services, complete baseline biological reports, regulatory permitting, and preparation of the appropriate California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents. Rhiannon provided botanical technical support for a large-scale special-status plant survey on the 3,400-acre Bowlsbey Ranch in Solano County. The surveys followed regulatory agency guidelines and were conducted for late season species. Biological communities surveyed included managed wetlands, tidal freshwater emergent wetlands, non-tidal wetlands, seasonal wetlands, riparian, irrigated pasturelands, and non-native grasslands.

Napa Ceanothus Surveys, various Clients, Napa County, California
Biologist
As part of vineyard development projects, Rhiannon conducted twelve surveys for Napa ceanothus (*Ceanothus purpureus*), a special-status plant which only occurs in Napa County. Tasks performed for this work included navigating dense chaparral to determine number of individuals. Information gathered from her efforts was used to determine appropriate mitigation for impacts to the species.

Special-Status Plant Surveys and Tree Surveys, Dharma Realm Buddhist Association, Mendocino County, California
Biologist
The Dharma Realm Buddhist Association owns the City of 10,000 Buddhas, a large state hospital converted to a Buddhist monastery and the Dharma Realm Buddhist University, near the town of Ukiah. Campus expansion is needed to support the many students and monks which reside at the City. As part of preliminary biological resources assessments, Rhiannon conducted two special-status plants surveys at the City of 10,000 Buddha's proposed campus expansion site. Habitats surveyed included wetlands, a walnut orchard and oak woodlands. Additionally, Rhiannon assisted a WRA arborist in conducting tree surveys which resulted in 203 trees representing nine species being assessed in six hours.

Santa Rosa Plain Special-Status Plant Surveys, Sonoma County Regional Parks, Sonoma County, California
Biologist
Rhiannon performed special-status plant surveys in the Santa Rosa Plain following protocol outlined in the Santa Rosa Plain Programmatic Biological Opinion (PBO) required by Sonoma County prior to the development of Moorland Park. Her responsibilities included visiting reference sites of potential special-status plants, including Burkes goldfield (*Lasthenia burkei*), Sonoma sunshine (*Blennosperma bakeri*), and Sebastopol meadowfoam (*Limnanthes vinculans*) prior to the site visit and surveying the entire site to determine presence of all special-status plant species.

California State Parks, Mendocino District, Special-Status Plant Surveys
Project Manager and Biologist
Rhiannon performed protocol-level special status plant surveys in Mackerricher State Park, Mendocino County to determine special-status plant populations within the sand dune, coastal prairie, closed cone pine forest, and wetland habitats along the Ten Mile haul road which is scheduled for improvements. She identified and documented several special-status plant species as well as many more common species known from the Mendocino coast. Rhiannon was Project Manager and lead botanist for this project. Duties required for this role included managing budgets, overseeing field efforts and working with client to determine Project Area.

Gorman Post Ranch, Special-Status Plant and Habitat Surveys, Los Angeles County
Biologist

Rhiannon provided botanical technical support for a large-scale floristic and special-status plant survey on the 24,400-acre Cojo-Jalama Ranch in Santa Barbara County. The surveys followed regulatory agency guidelines and were conducted through the growing season. Biological communities surveyed included coast live oak woodlands, chamise chaparral, sagebrush scrub, golden bush scrub, purple sage scrub, black sage scrub, native and non-native grasslands, and wetlands.

Wetland Delineations

Lookout Slough, Solano County, California

Biologist

The Lookout Slough Restoration Project will create, restore, and maintain ideal habitat conditions to encourage the proliferation of Delta smelt, winter-run and spring-run Chinook salmon, as well as Central Valley steelhead, and longfin smelt. Restoration of the Study Area will provide important spawning, and rearing habitat, would support the aquatic food web and would be generally beneficial to the recovery of these imperiled species. For this project, Rhiannon was part of the field effort which delineated wetlands for the project.

Yellow Rose Ranch, Napa County

Biologist

The Yellow Rose Ranch Project is a proposed housing development within the City of Calistoga, Napa County. Rhiannon led the wetland delineation field effort and subsequent delineation report.

Three Sticks Winery, Pressley Road, Sonoma County

Biologist

Rhiannon led the wetland delineation field effort and drafting of the subsequent delineation report. The report was submitted to the Corps. for a PJD. A site visit was conducted with Corps. staff for the PJD; Rhiannon was present during the PJD site visit with the Corps., and guided Corps. staff through the site. The features Rhiannon identified as potential wetlands were approved by the Corps. for the PJD and no additional features were added. This PJD will be used to obtain permits to develop the winery.

Bay West Development, Wetland Delineation, Solano County

Project Manager and Biologist

Rhiannon acted as Project Manager for a Wetland Delineation and BRA for a client as part of a land sale. Her responsibilities included identifying potential wetlands within the parcel using the Arid West Manual Regional Supplement to the Corps protocol which include identifying wetland vegetation, wetland soils and wetland hydrology indicators. Her report was submitted to the Corps and was granted a Preliminary Jurisdiction Determination (PJD) for the client. As part of the BRA, she performed a floristic survey, vegetation mapping, and determined potential for local rare plants to occur within the site.

Langtry Farms, Wetland Delineation, Lake County, California

Biologist

As part of a larger biological resources assessment, Rhiannon was part of a field crew of six biologists who documented wetlands and streams over a 4,000-acre portion of the Guenoc Ranch property located in Lake County, California. The team documented an extensive network of streams, ponds, and seasonal wetlands. Years of water management for cattle and agriculture, combined with naturally problematic conditions such as dark soils from serpentine parent materials, made this a complex delineation. The team mapped over 152 acres of aquatic habitats, including nearly 350,000 linear feet of streams.

APPENDIX D. ARBORIST REPORT

Chalk Hill Road Bridge Replacement Project

Arborist Report

Unincorporated Sonoma County, California





Prepared for:

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October 2025

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WRA#27316

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APPENDIX B. REPRESENTATIVE PHOTOGRAPHS

List of Preparers

Justin Semion	Principal in Charge
Rob Carnachan	Project Manager
Daniel Elting	Wildlife Biologist
Andy Frank	ISA Certified Arborist
Carla Angulo	ISA Certified Arborist
Mehak Suji	Biologist
Rhona McChesney	GIS Specialist

List of Acronyms

AVC	Arboreal Value Chart
AV	Arboreal Valuations
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CFGC	California Fish and Game Code
DBH	Diameter at breast height
TPO	Tree Protection Ordinance
WRA	WRA, Inc.

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1.0 INTRODUCTION

On July 21, 2025, WRA, Inc. (WRA) conducted an arborist survey at the site of the proposed Chalk Hill Road Bridge Replacement Project (Project), located in the Alexander Valley region of northeastern Sonoma County, California. The majority of Project is located within Assessor's Parcel Number (APN) 132-080-023, with small portions crossing into APNs 132-060-013 and 132-080-003. The Project site is within the Land Intensive Agriculture (LIA) General Plan land use designation and the County of Sonoma (County) is the Project proponent. The survey was conducted in accordance with the County Tree Ordinances and to characterize potential impacts for regulatory permitting and California Environmental Quality Act (CEQA) documentation.

The Project includes replacement of the existing one-lane Chalk Hill Road bridge, a Sonoma County historic landmark, to ensure safe crossing for vehicles, bicyclists, and pedestrians over Maacama Creek. The bridge corridor provides access from communities such as Windsor, Mark West Springs, Larkfield-Wikiup and Santa Rosa via U.S. Highway 101, and connects them to the rural, agricultural areas of Alexander Valley. However, the existing bridge is at risk of collapse from earthquakes and landslides, is scour critical, and has been deemed by the California Department of Transportation (Caltrans) to be functionally obsolete. The purpose of the Project is to ensure safe crossing for vehicles, bicyclists, and pedestrians over Maacama Creek by replacing the existing bridge.

1.1 Study Area Description

The proposed Project site is 6.38 acres and is located along Chalk Hill Road approximately 1.25 miles south of State Route 128 within the eastern portion of Sonoma County (Study Area). The majority of the Study Area comprises portions of Chalk Hill Road, a two-lane throughfare that begins east of Windsor and extends north until terminating at its junction with State Route 128. The existing bridge structure is an historic one-lane bridge which carries Chalk Hill Road over Maacama Creek. Areas of the Study Area outside of Chalk Hill Road include portions of surrounding parcels, which consist of agricultural and residential lands, Maacama Creek, and surrounding riparian areas (Figure 1).

1.2 Regulatory Background

1.2.1 Sonoma County Municipal Code

TREE PROTECTION ORDIANCE

The County of Sonoma recognizes the aesthetic, environmental, and economic benefits mature trees provide to the citizens of the County. Chapter 26.88.015, "Tree protection ordinance" of the Sonoma County Municipal Code intends to support the essential community and ecosystem functions of trees by enforcing protection and requiring mitigation for removed trees. In addition, facilitation of hazard reduction, forest health, and property maintenance by exempting certain activities. The Tree protection ordinance (TPO) defines a "Protected Tree" as any tree of the following species exceeding 6" diameter-by- breast height (DBH):

Cottonwoods:

- Fremont cottonwood (*Populus fremontii*)
- Black cottonwood (*Populus trichocarpa*)

Oaks:

- Black oak (*Quercus kelloggii*)
- Blue oak (*Quercus douglasii*)
- Canyon live oak (*Quercus chrysolepis*)
- Coast live oak (*Quercus agrifolia*)
- Interior live oak (*Quercus wislizenii*)
- Oregon oak (*Quercus garryana*)
- Valley oak (*Quercus lobata*)

Alders:

- Red alder (*Alnus rubra*)
- White alder (*Alnus rhombifolia*)

Willows:

- Red willow (*Salix laevigata*)
- Pacific willow (*Salix lucida*)

Cypress:

- Monterey cypress (*Hesperocyparis macrocarpa*)
- Macnab cypress (*Hesperocyparis macnabiana*)

Pines:

- Knobcone pine (*Pinus attenuata*)
- Lodgepole pine (*Pinus contorta*)
- Sugar pine (*Pinus lambertiana*)
- Bishop pine (*Pinus muricata*)
- Ponderosa pine (*Pinus ponderosa*)
- Foothill pine (*Pinus sabiniana*)

Other:

- Big Leaf maple (*Acer macrophyllum*)
- Boxelder (*Acer negundo*)
- California black walnut (*Juglans californica*)
- California buckeye (*Aesculus californica*)
- madrone (*Arbutus menziesi*i)
- Oregon ash (*Fraxinus latifolia*)
- Grand fir (*Abies grandis*)
- Coast Redwood (*Sequoia sempervirens*)
- Western hemlock (*Tsuga heterophylla*)

OAK WOODLAND COMBINING DISTRICT AND VALLEY OAK HABITAT COMBINING DISTRICT

Chapter 26.67 of the Sonoma County Municipal Code provides for protection and enhancement of oak trees and oak woodland habitats. Article 67, Oak Woodland Combining District and Valley Oak Habitat Combining District, of the Sonoma County Zoning Code provides for protection and enhancement of oak trees and oak woodland habitats. Removal of oak trees in this zoning district requires mitigation measures including retention of other oaks, replacement plantings, and/or an in-lieu fee. While this portion of the zoning code is typically not applicable to County

Public Works projects, it is used as a guide for determining impacts and appropriate mitigation measures.

RIPARIAN CORRIDOR COMBINING ZONE

Under Section 26.65.040.O the removal or trees that are subject to a zoning permit or allowed under the base zone and combining zones is allowed within riparian corridors. However, tree stumps should not be removed unless the stump poses a hazard and it can be removed without increasing the risk or erosion or sedimentation in the riparian corridor.

HERITAGE OR LANDMARK TREES

Chapter 26D of the Sonoma County Municipal Code establishes provisions for the protection of "heritage" and "landmark" trees throughout the County. A "Heritage tree" is defined as "a tree or grove of trees so designated by the Sonoma County board of supervisors because of historical interest or significance". A "Landmark tree" is defined as "a tree or grove of trees so designated by the Sonoma County board of supervisors because of its outstanding characteristics in terms of size, age, rarity, shape or location". There is no permit requirement to trim, prune, or maintain a "heritage" or "landmark" tree as long as no damage is done to the tree. Further details related to the permit processing procedures and the exemptions for the permit can be found in Section 26D.5 and 26D.6, respectively.

CALIFORNIA FISH AND GAME CODE SECTION 1602-1610

Streams and lakes, as habitat for fish and wildlife species, are regulated by the California Department of Fish and Wildlife (CDFW) under Sections 1600-1616 of California Fish and Game Code (CFGC). Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term "stream," which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). Riparian vegetation has been defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation including riparian trees also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW, and mitigation may be required to offset impacts to riparian trees.

2.0 METHODS

On July 21, 2025, WRA ISA-Certified Arborist, Andy Frank (#WE-12825A) surveyed the Study Area on-foot to inventory all trees within the proposed Project area likely to be considered County "protected" or state riparian trees. Pertinent information collected for each surveyed tree including species, DBH, estimated crown radius, estimated height, and health, condition and structure ratings.

2.1 Tree Inventory

Locations of trees within the Study Area were recorded using a handheld GPS unit with sub-meter accuracy. Each tree was given an aluminum tree tag with unique identification number and are included in Appendix A.

DBH was calculated for surveyed trees by measuring the trunk diameter at 4.5 feet above grade. DBH for multi-trunked trees was calculated by measuring each individual trunk and calculating the sum total of trunk diameters. In cases where multi-trunked trees had more than five main trunks, only the five largest trunks were measured. In cases where an irregular buttress or bulge occurred at two feet above ground or DBH, measurements were taken above or below the irregular feature in order to best represent the size of the tree. In cases where dense poison oak prevented safe access to the trunk of the tree, DBH was visually estimated.

2.2 Tree Assessment

General notes on the condition of trees were taken, including health, structure, and overall condition. Assessment of the health, structure, and overall condition of each tree was conducted according to the narratives listed in Table 1.

Table 1. Rating Narratives for Tree Assessment

	HEALTH	STRUCTURE	GENERAL CONDITION
Good	Tree is free from symptoms of disease and stress.	Tree is free from major structural defects.	Tree shows condition of foliage, bark, and overall structure characteristic of the species and lacking obvious defect, or disease.
Fair	Tree shows some symptoms of disease or stress including twig and small branch dieback, evidence of fungal / parasitic infection, thinning of crown, or poor leaf color.	Tree shows some structural defects in branches but overall structure is stable.	Tree shows condition of foliage, bark, and overall structure characteristic of the species with some evidence of stress, defect, or disease.
Poor	Tree shows symptoms of severe decline.	Tree shows structural failure of a major branch or co-dominant trunk.	Tree shows condition of foliage, bark, and overall structure uncharacteristic of the species with obvious evidence of stress, defect, or disease.

3.0 RESULTS

3.1 Tree Inventory

Seventy-four (74) trees were assessed in the Study Area: four arroyo willow (*Salix lasiolepsis*), five blue oaks, six California bay (*Umbellularia californica*), nine California black oak, 25 coast live oak, two sandbar willow (*Salix exigua*), one Douglas fir (*Pseudotsuga mensenzii*), one Northern California black walnut, one Oregon ash, one pistachio (*Pistacia atlantica*), four red willows (*Salix laevigata*), four valley oak, and 11 white alder. Of the 74 trees, 64 are considered County "protected" or are likely to be considered riparian trees under the CFGC.

3.2 Tree Assessment

All trees were assessed for their condition, health, and structure. The majority of trees surveyed within the Study Area ranked "Fair" in general condition, health, and structure with most trees displaying only minimal signs of maladies or decline in vigor. There are seven trees in poor condition and nine trees with poor structure. General maladies observed that lead to the "Poor" health and condition rankings given below included leaning codominant trunks, minor to significant decay/dieback, suppressed and leaning growth forms, and twig and leaf galls. Table 2 below summarizes the assessment results for all trees surveyed.

Table 2: Tree Assessment Results Summary

CRITERIA ASSESSED/RATING	CONDITION	HEALTH	STRUCTURE
Good	27 (36%)	20 (27%)	18 (24%)
Fair	40 (55%)	50 (68%)	47 (64%)
Poor	7 (9%)	4 (5%)	9 (12%)

3.3 Tree Impact Assessment

Of the 74 trees in the Study Area, 42 are slated for removal as a result of the Project including 36 that are likely to be considered County or State protected (Figure 2). The 36 protected trees to be removed include two arroyo willows (#198, #200), three blue oaks (#013, #014, #15), eight California black oaks (#004, #005, #006, #008, #009, #J, #N, #O) five coast live oaks (#016, #182, #183, #H, #L), two sandbar willows (#195, #196), one northern California black walnut (#001), one Oregon ash (#023), two red willows (#185, #187), two valley oaks (#180, #K), and 10 white alders (#184, #186, #188 - #194, #199).

4.0 SUMMARY AND RECOMMENDATIONS

There are 64 trees which are “protected trees” within the Project site and 36 are to be removed as a result of Project activities. Any existing trees which are less than 6” DBH may count as mitigation for the removal of the other trees. The County standards per the TPO for calculating mitigation re-planting offsets are through calculation of a Total Arboreal Value Chart. An Arboreal Value analysis for the Project’s proposed tree impacts are provided below in Table 3.

Table 3. Arboreal Value Calculation (Sonoma County)*

DBH (INCHES)	REMOVED TREES	WEIGHTED VALUE	ARBOREAL VALUE
6-12	6	1	6
Over 12-18	9	2	18
Over 18-24	3	3	9
Over 24-30	2	4	8
Over 30-36	2	5	10
Total Arboreal Value			51

*Calculation does not include riparian tree removals below 6” that may be recognized as protected by CDFW

County mitigation standards aim to offset the Total Arboreal Value of all protected trees removed to the following re-planting standards. *

1 Point AV:

1. Six 5-gallon trees (can be existing trees on site that are below 6” DBH if preservation methods are part of a development permit)
2. Two 15-gallon trees

2 Points AV: 24 inches Box Tree

*On traditional zoning permits for non-County owned projects, in-lieu fees are also a potential avenue for achieving County-mandated tree mitigation

4.1 Tree Protection Plan

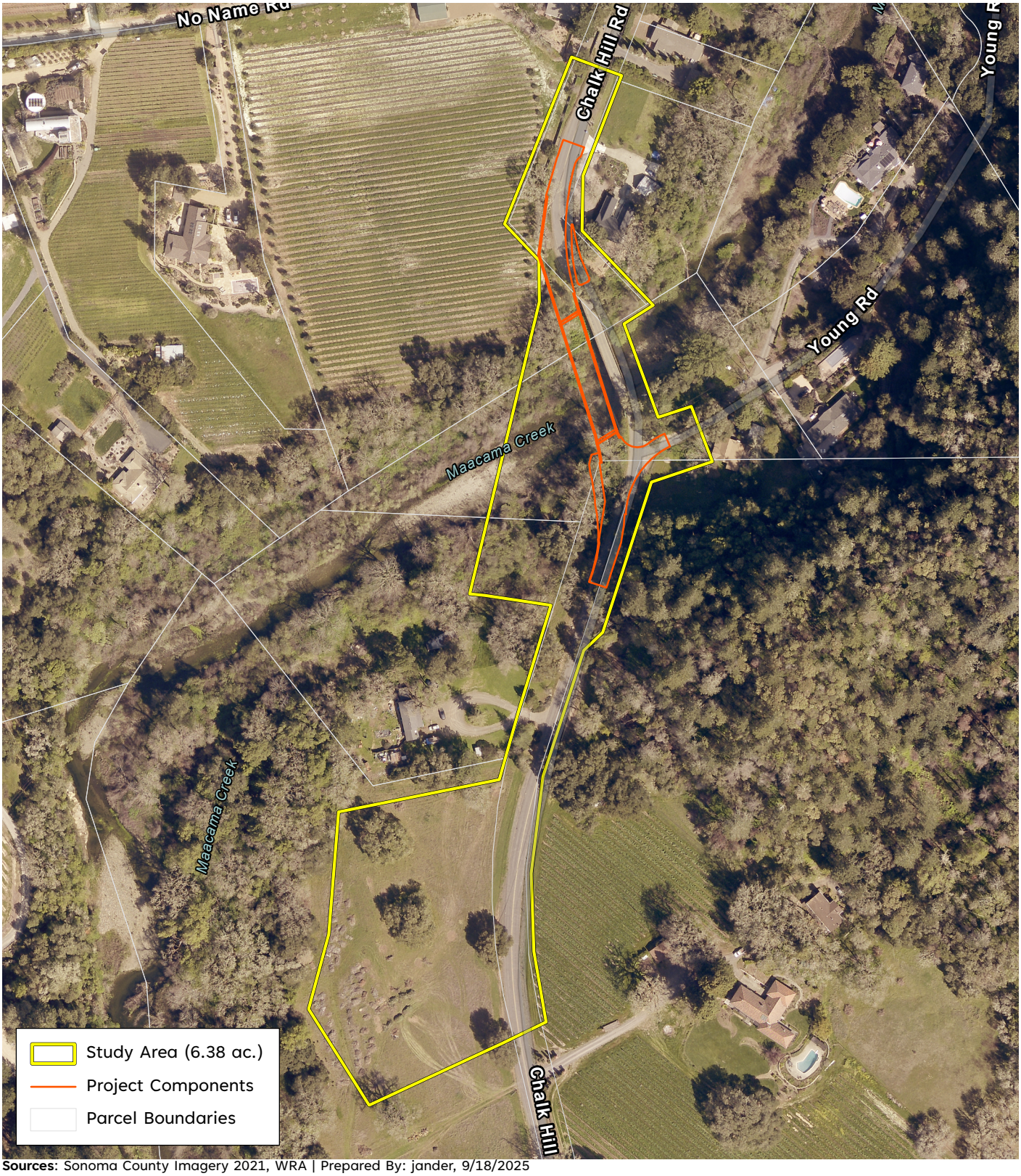
A Tree Protection Plan (TPP) shall be produced which will aim to mitigate the impact to protected trees to achieve County standard offsets (51 Total Arboreal Value) and potential additional tree re-planting in riparian areas at the discretion of the final issued CDFW Lakebed and Stream and Alteration Agreement. All trees to be removed and remain within the Project Area will be depicted on the final site plans. A total of 22 trees will remain on site and be subject to County standard protection measures which are outlined below:

- Protected trees, their protected perimeter, and whether they are to be retained or removed are to be clearly shown on all improvement plans. A note shall be placed on the improvement plans that "Construction is subject to requirements established by Sonoma County to protect certain trees."

- Before the start of any clearing, excavation, construction, or other work on the site, every tree designated for protection on the approved site plan shall be clearly delineated with a substantial barrier (steel posts and barbed wire, chain link fencing, orange construction fencing, or other exclusionary barrier) at the protected perimeter or limits established during the permit process. The delineation markers shall remain in place for the duration of all work. All trees to be removed shall be clearly marked. A scheme shall be established for the removal and disposal of brush, earth and other debris as to avoid injury to any protected tree.
- Where proposed development or other site work must encroach upon the protected perimeter of a protected tree, special measures shall be incorporated to allow the roots to obtain oxygen, water and nutrients. Tree wells or other techniques may be used where advisable. No changes in existing ground level shall occur within the protected perimeter unless a drainage and aeration scheme approved by a certified arborist is utilized. No burning or use of equipment with an open flame shall occur near or within the protected perimeter (except for authorized controlled burns).
- No storage or dumping of oil, gasoline, chemicals or other substances that may be harmful to trees shall occur within the protected perimeter of any tree, or any other location on the site from which such substances might enter the protected perimeter. If any damage to a protected tree should occur during or as a result of work on the site, the county shall be promptly notified of such damage. If a protected tree is damaged so that it cannot be preserved in a healthy state, the planning director shall require replacement in accordance with the arboreal value chart. If on-site replacement is not feasible, the applicant shall pay the in-lieu fee to the tree replacement fund.
- Underground trenching for utilities shall avoid tree roots within the protected perimeter. If avoidance is impractical, tunnels should be made below major roots. If tunnels are impractical and cutting roots is required, it shall be done by hand-sawn cuts after hand digging trenches. Trenches shall be consolidated to serve as many units as possible.
- Compaction within the protected perimeter shall be avoided.
- Paving with either concrete or asphalt over the protected perimeter should be avoided. If paving over the protected perimeter cannot be avoided, affected trees shall be treated as removed for purposes of calculating arboreal values.
- Wherever possible, septic systems and/or leachlines shall not be located on the uphill side of a protected tree.
- Security posted for the purpose of insuring the proper construction of public or private improvements shall also include an amount sufficient to secure any requirements imposed pursuant to this section. In addition, security for potential tree damage shall be twenty-five percent (25%) of the amount posted for planned tree replacement. In lieu fees shall be paid prior to recording any maps. Such security shall not be released until protection requirements, including planting replacement trees, and any long term maintenance requirements have been satisfactorily discharged. The initial bond amount may be reduced to cover only the maintenance and replacement of trees after construction is completed.
- The Valley Oak (*Quercus lobata*) shall receive special consideration in the design review and other discretionary permit processes to the extent that mature specimens shall be retained to the fullest extent feasible.

5.0 REFERENCES

Sonoma County Permit Sonoma 2025	Permit Sonoma. Sonoma County Tree Permit Requirements. 2025. https://permitsonoma.org/regulationsandlongrangeplans/regulationsandinitiatives/treepermitrequirements.
Google Earth 2025	Google Earth. 2025. Aerial Photography 1993-2025.



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Sources: Sonoma County Imagery 2021, WRA | Prepared By: jander, 9/18/2025

Figure 1. Aerial Photograph

Chalk Hill Road
Bridge Replacement Project
Sonoma County, CA

0 250 500 Feet

N

wra Environmental Consultants



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Sources: Sonoma County Imagery 2021, WRA | Prepared By: jander, 9/18/2025

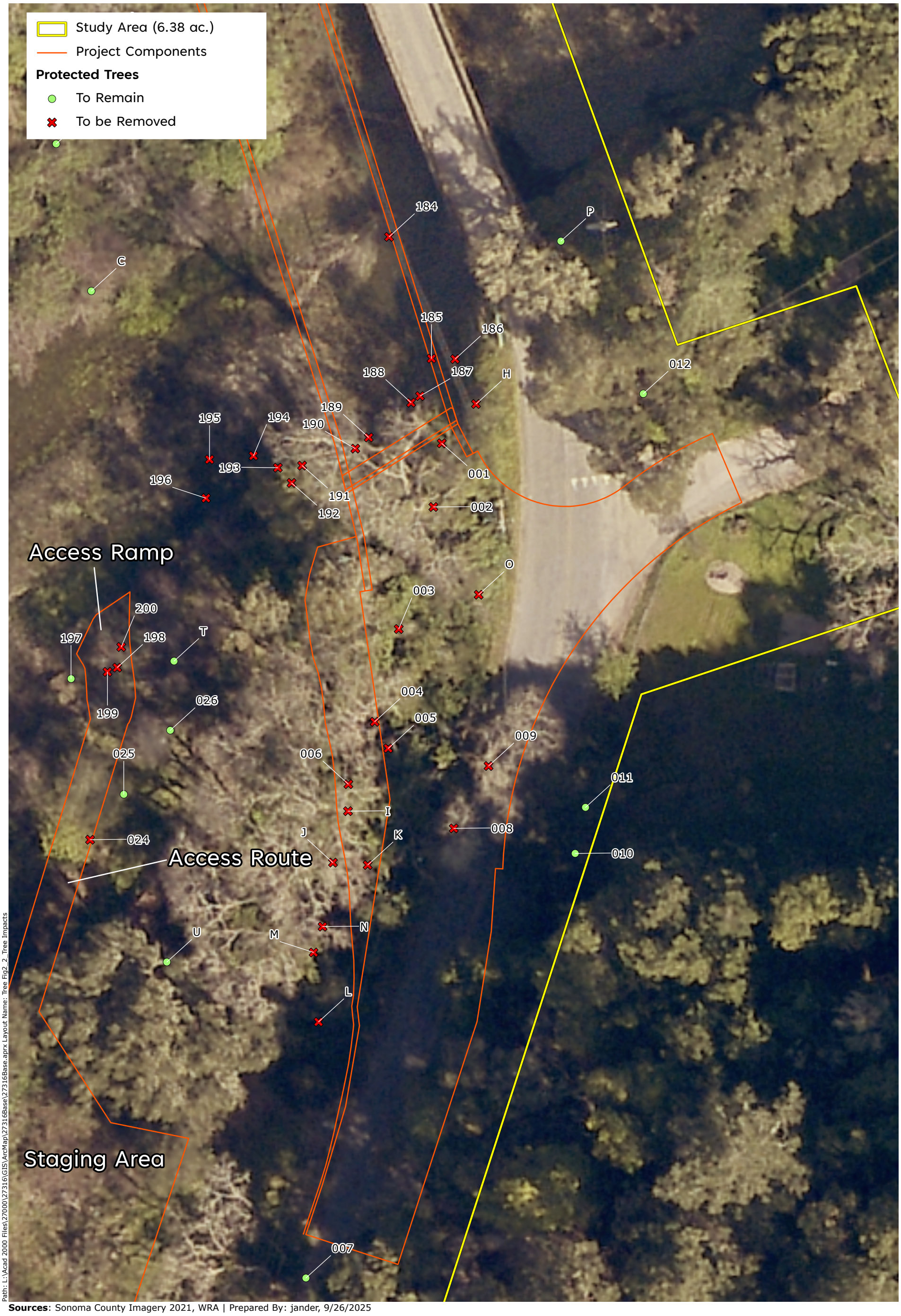
Figure 2.1 Tree Impacts

Chalk Hill Road
Bridge Replacement Project
Sonoma County, CA

0 25 50 Feet

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wra Environmental Consultants



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Sources: Sonoma County Imagery 2021, WRA | Prepared By: jander, 9/26/2025

Figure 2.2 Tree Impacts

Chalk Hill Road
Bridge Replacement Project
Sonoma County, CA

0 25 50 Feet

N

wra Environmental Consultants



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Sources: Sonoma County Imagery 2021, WRA | Prepared By: jander, 9/18/2025

Figure 2.3 Tree Impacts

Chalk Hill Road
Bridge Replacement Project
Sonoma County, CA

0 25 50 Feet

N

wra Environmental Consultants

APPENDIX A. TREE SURVEY TABLE

Appendix A. Tree Inventory and Impacts Table

Tag ID	Common Name	Scientific Name	DBH_1	DBH_2	DBH_3	DBH_4	DBH_5	Total DBH	Dripline_1	Dripline_2	Height	Condition	Health	Structure	Comments	County/State Protected	Proposed for Removal
18	Blue oak	Quercus douglasii	16					16	30	35	30	Good	Good	Good	Against cattle fence on private property	Yes	No
001	Northern California black walnut	Juglans hindsii	31					31	35	30	45	Poor	Poor	Poor	Lots of dieback likely from previous apical stem failure	Yes	Yes
002	California bay	Umbellularia californica	9	10	10			29			35	Fair	Fair	Poor	Previously trimmed stems, canopy overhanging road	No	Yes
003	California bay	Umbellularia californica	28	6	10	11	9	64	50	50	40	Fair	Fair	Fair		No	Yes
004	California Black Oak	Quercus kelloggii	14					14	25	15	35	Good/Excellent	Good/Excellen	Good/Excellent		Yes	Yes
005	California Black Oak	Quercus kelloggii	12	16				28	35	45	55	Good	Fair	Fair	Previous stem removal at base	Yes	Yes
006	California Black Oak	Quercus kelloggii	20					20	25	35	50	Fair	Fair	Fair	Poison oak at base, est dbh	Yes	Yes
007	California Black Oak	Quercus kelloggii	36					36	50	50	55	Good	Fair	Fair	Canopy overhangs impact zone	Yes	No
008	California Black Oak	Quercus kelloggii	13					13	30	20	35	Fair	Fair	Fair	Canopy unbalanced, overhangs road	Yes	Yes
009	California Black Oak	Quercus kelloggii	19					19	35	30	40	Fair	Fair	Fair	Co-dominant split at 10 ft, overhanging road	Yes	Yes
010	Coast Live Oak	Quercus agrifolia	14					14	25	25	30	Fair	Fair	Fair	Watch for trenching affecting roots	Yes	No
011	Coast Live Oak	Quercus agrifolia	13					13	35	35	35	Fair	Fair	Fair	Along road, watch for trenching same as 010	Yes	No
012	Coast Live Oak	Quercus agrifolia	38	30				68	65	40	45	Good	Fair	Fair	Rooted near road	Yes	No
013	Blue oak	Quercus douglasii	34					34	35	40	35	Good	Good	Good	Along cattle fence	Yes	Yes
014	Blue oak	Quercus douglasii	13					13	25	25	30	Fair	Fair	Fair	Previous large limb pruning resulted in large cavity	Yes	Yes
015	Blue oak	Quercus douglasii	22					22	30	30	30	Fair	Fair	Fair	Large cavity at base	Yes	Yes
016	Coast Live Oak	Quercus agrifolia	6					6	5	5	10	Fair	Good	Fair	DBH measured below stem split	Yes	Yes
017	Blue oak	Quercus douglasii	48					48	60	50	45	Good	Good	Good	Large blue oak, along cattle fencing	Yes	No
019	Coast Live Oak	Quercus agrifolia	50					50	45	45	40	Good	Good	Good	Along cattle fence	Yes	No
020	Coast Live Oak	Quercus agrifolia	45					45	50	50	40	Good	Good	Good	Cattle fencing	Yes	No
021	Coast Live Oak	Quercus agrifolia	7	8				15	25	25	25	Fair	Fair	Fair		Yes	No
022	Coast Live Oak	Quercus agrifolia	7					7	20	20	20	Fair	Fair	Fair		Yes	No
023	Coast Live Oak	Quercus agrifolia	6					6	20	15	15	Fair	Fair	Fair		Yes	No
024	Oregon Ash	Fraxinus latifolia	7					7	20	15	25	Good	Fair	Fair		Yes	Yes
025	Coast Live Oak	Quercus agrifolia	14					14	30	30	30	Fair	Fair	Fair		Yes	No
026	Valley Oak	Quercus lobata	11					11	20	20	35	Good	Good	Good		Yes	No
173	Pistachio	Pistacia atlantica	2	2	3			7	30	30	15	Poor	Fair	Very Poor	Not protected Under bridge. Previously trimmed	No	Yes
174	Coast Live Oak	Quercus agrifolia	12					12	40	0	20	Poor	Fair	Very Poor	Phototropic lean uncorrected, 45 deg angle, 20% dieback	Yes	No
175	California Bay	Umbellularia californica	6					6	15	20	35	Good	Fair	Fair	Reactionary growth along trunk	No	No
176	Coast Live Oak	Quercus agrifolia	20					20	35	30	45	Fair	Fair	Fair	Canopy overhanging bridge	Yes	No
177	Coast Live Oak	Quercus agrifolia	24					24	50	10	35	Fair	Fair	Poor	Likely outside of impact zone, but canopy overhangs bridge	Yes	No
178	Coast Live Oak	Quercus agrifolia	26					26	40	20	40	Fair	Fair	Fair	Measured below stem split, slight phototropic lean	Yes	No
179	Coast Live Oak	Quercus agrifolia	28					28	45	45	50	Good	Fair	Good	Corrected structure, good branching towards canopy	Yes	No
180	Valley Oak	Quercus lobata	28	26				54	50	50	65	Good	Good	Good	Poison oak around base, est dbh.	Yes	Yes
181	California Bay	Umbellularia californica	11					11	25	20	45	Good	Fair	Fair	1 ft away from 180	No	Yes
182	Coast Live Oak	Quercus agrifolia	12	14				26	30	30	20	Fair	Fair	Fair	Poison oak, dbh est, 25% dieback	Yes	Yes
183	Coast Live Oak	Quercus agrifolia	7	8	6			21	25	25	20	Fair	Fair	Fair	10% dieback	Yes	Yes
184	White alder	Alnus rhombifolia	7	7				14	10	10	10	Poor	Poor	Poor	Damage on trunk from previous washouts, rooted within sandbar in creek	Yes	Yes
185	Red Willow	Salix laevigata	6	2				8	10	10	15	Fair	Good	Fair	Multiple stems	Yes	Yes

Tag ID	Common Name	Scientific Name	DBH_1	DBH_2	DBH_3	DBH_4	DBH_5	Total DBH	Dripline_1	Dripline_2	Height	Condition	Health	Structure	Comments	County/State Protected	Proposed for Removal
186	White alder	Alnus rhombifolia	3					3	5	5	15	Fair	Fair	Fair	Herbivory damage, riparian tree	Yes	Yes
187	Red Willow	Salix laevigata	4					4	5	5	10	Fair	Fair	Fair	Riparian	Yes	Yes
188	White alder	Alnus rhombifolia	2	2	3			7	5	5	10	Fair	Fair	Fair	Riparian	Yes	Yes
189	White alder	Alnus rhombifolia	2					2	5	5	10	Fair	Fair	Fair		Yes	Yes
190	White alder	Alnus rhombifolia	4	2				6	10	10	15	Fair	Fair	Fair		Yes	Yes
191	White alder	Alnus rhombifolia	3	2	2	2		9	10	10	10	Fair	Fair	Fair		Yes	Yes
192	White alder	Alnus rhombifolia	4					4	10	10	15	Fair	Fair	Fair		Yes	Yes
193	White alder	Alnus rhombifolia	2	2				4	5	5	10	Fair	Fair	Fair		Yes	Yes
194	White alder	Alnus rhombifolia	2					2	5	5	10	Fair	Fair	Fair		Yes	Yes
195	Coyote Willow	Salix exigua	2	2				4	10	10	10	Fair	Fair	Fair	Herbivory damage	Yes	Yes
196	Coyote Willow	Salix exigua	2	2				4	5	10	10	Fair	Fair	Fair		Yes	Yes
197	White alder	Alnus rhombifolia	7					7	15	15	15	Good	Good	Good		Yes	No
198	Arroyo Willow	Salix lasiolepis	3					3	10	10	10	Fair	Fair	Fair		Yes	Yes
199	White alder	Alnus rhombifolia	4	3				7	15	15	10	Fair	Fair	Fair		Yes	Yes
200	Arroyo Willow	Salix lasiolepis	2	2	4	5	2	15	25	20	20	Fair	Fair	Fair		Yes	Yes
A	Valley Oak	Quercus lobata	50	25				75	75	50	70	Good/Excellent	Good/Excellen	Good/Excellent	Not accessible, dbh est. large canopy overhanging impact area, photo 7664-7667	Yes	No
B	California Bay	Umbellularia californica	12					12				Good	Good	Fair	Canopy near impact area, est dbh	No	No
C	Red Willow	Salix laevigata	6					6	25	25	15	Good	Good	Good	Est dbh, multiple stems clump of willows rooted at TOB assessed from within creek	Yes	No
E	Arroyo Willow	Salix lasiolepis	6					6	10	10	20	Good	Good	Good	Many stems, a part of willow thicket adjacent to D	No	No
F	Arroyo Willow	Salix lasiolepis	6					6	30	25	35	Good	Good	Good	Behind E. DBH est	No	No
H	Coast Live Oak	Quercus agrifolia	6					6	10	10	20	Poor	Poor	Fair	Inaccessible trunk located on edge of steep slope.	Yes	Yes
I	Douglas fir	Pseudotsuga menziesii	16					16	10	15	55	Fair	Fair	Fair	Poison oak at base, est dbh	No	Yes
J	California Black Oak	Quercus kelloggii	17					17	45	45	50	Good	Fair	Fair	Co-dominant stems, poison oak at base, est dbh	Yes	Yes
K	Valley oak	Quercus lobata	26					26	45	45	55	Good	Good	Good	Poison oak at base, est dbh	Yes	Yes
L	Coast live oak	Quercus agrifolia	18					18	40	40	40	Fair	Fair	Poor	Large limbs overhanging road co-dominant stems	Yes	Yes
M	California Bay	Umbellularia californica	8	12				20	30	30	55	Fair	Fair	Fair	Likely out of impact area	No	Yes
N	California Black Oak	Quercus kelloggii	16					16	35	30	55	Fair	Fair	Fair	Likely out of impact area, poison oak at base, est dbh	Yes	Yes
O	California Black Oak	Quercus kelloggii	13					13	20	0	25	Poor	Fair	Very Poor	Previous apical stem damage and dbh est. unbalanced canopy overhangs road	Yes	Yes
P	Coast Live Oak	Quercus agrifolia	35					35	30	25	25	Fair	Fair	Fair	Poison oak dbh est. co-dominant split at 12 ft	Yes	No
Q	Coast Live Oak	Quercus agrifolia	52					52			40	Good	Good	Good	Near house. Dbh est. canopy overhangs road	Yes	No
S	Coast Live Oak	Quercus agrifolia	60					60	50	40	35	Good	Good	Good	Measured below stem split, co-dominant stems, est dbh	Yes	No
T	Coast Live Oak	Quercus agrifolia	60					60	45	45	35	Good	Good	Good	Multi stem split at base, est dbh	Yes	No
U	Coast Live Oak	Quercus agrifolia	8					8	30	25	25	Good	Fair	Fair	Est dbh	Yes	No
V	Red Willow	Salix laevigata	7					7	15	10	10	Poor	Poor	Very Poor	Willow rooted above TOB, just over 6 in est dbh	Yes	No
W	Coast Live Oak	Quercus agrifolia	48					48	40	30	40	Fair	Fair	Fair	Leaning	Yes	No

APPENDIX B. REPRESENTATIVE PHOTOGRAPHS



Photo 1. The existing Chalk Hill Road Bridge over Maacama Creek. Photo taken on July 21, 2025, facing northeast.



Photo 2. Underneath the existing Chalk Hill Road Bridge north of Maacama Creek. Photo taken on July 21, 2025, facing south.



Photo 3. On the existing Chalk Hill Road Bridge over Maacama Creek. Photo taken on July 21, 2025, facing southwest.



Photo 4. A white alder (*Alnus rhombifolia*) within the Study Area, south of Maacama Creek and east of Chalk Hill Road. Tag ID: 184. Photo taken on July 21, 2025, facing west.



Photo 5. A coast live oak (*Quercus agrifolia*) within the Study Area, south of Maacama Creek and east of Chalk Hill Road. Tag ID: 010. Photo taken on July 21, 2025, facing west.



Photo 6. A blue oak (*Quercus douglasii*) within the Study Area, north of Maacama Creek and east of Chalk Hill Road. Tag ID: 013. Photo taken on July 21, 2025, facing southwest.



Photo 7. A valley oak (*Quercus lobata*) within the Study Area, south of Maacama Creek and west of Chalk Hill Road. Tag ID: 026. Photo taken on July 21, 2025, facing east.



Photo 8. A red willow (*Salix laevigata*) within the Study Area, south of Maacama Creek and east of Chalk Hill Road. Tag ID: 185. Photo taken on July 21, 2025, facing south.

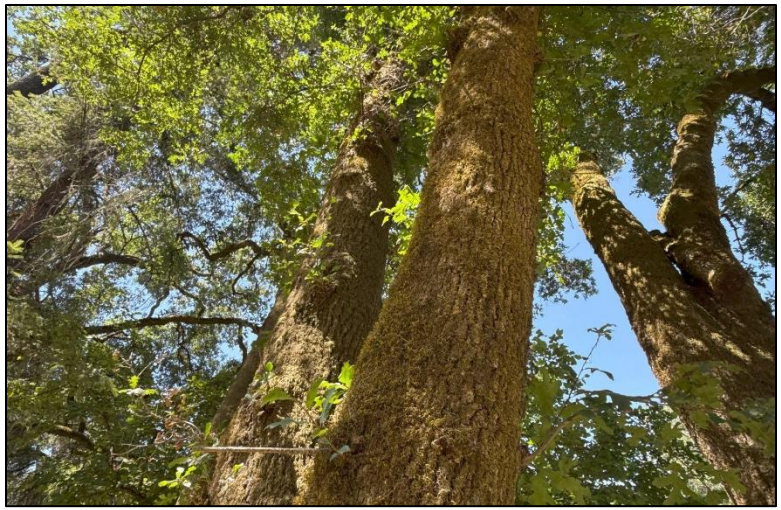


Photo 9. A California black oak (*Quercus kelloggii*) within the Study Area, south of Maacama Creek and east of Chalk Hill Road. Tag ID: 005. Photo taken on July 21, 2025, facing west.



Photo 10. An Oregon ash (*Fraxinus latifolia*) within the Study Area, south of Maacama Creek and west of Chalk Hill Road. Tag ID: 024. Photo taken on July 21, 2025, facing northeast.



Photo 11. Southern portion of Chalk Hill Road within the Study Area. Photo taken on July 21, 2025, facing north.



Photo 12. Northern portion of Chalk Hill Road within the Study Area. Photo taken on July 21, 2025, facing south.

APPENDIX E. NOISE ASSESSMENT

Integrated Waste
Road & Bridge Operations
Sonoma County Airport
Sonoma County Transit

Johannes J. Hoevertsz, Director

Trish Pisenti, Deputy Director- Transportation & Operations
Janice Thompson, Deputy Director- Engineering & Maintenance

May 18, 2022

Reference: Chalk Hill Road Over Maacama Creek Bridge Replacement
Technical Memorandum – Noise Assessment
Federal Project No.: BRLO-5920(118)

The purpose of this Technical Memorandum is to present potential noise and vibration impacts generated by the proposed project.

Proposed Project

The project proposes to construct a new replacement bridge to carry Chalk Hill Road over Maacama Creek and to reconstruct the intersection with Young Road located southeast of the replacement bridge. The project also proposes to remove the existing historic bridge and to build scour countermeasures along the south creekbank.

The existing one-lane substandard bridge would be replaced with a two-lane bridge built to modern American Association of State Highway and Transportation Officials (AASHTO) standards. The replacement bridge would have two 11-foot lanes and two 4-foot shoulders for a total clear roadway width of 30 feet. A 30-foot clear width meets minimum AASHTO lane and shoulder widths for an average daily traffic (ADT) of 400-1,500 and complies with the 2010 Sonoma County Bicycle and Pedestrian Plan for mixed use.

The replacement bridge would be a new two-lane crossing downstream (west) of the existing bridge. The replacement bridge would cross the creek with a single-span concrete box girder and would be supported on reinforced concrete abutments. The replacement bridge would have retaining walls along the west side of the approach roadways. The south approach would have a 31-foot-long retaining wall with a maximum exposed height of 15 feet. The north approach would have a 191-foot-long retaining wall with a maximum exposed height of 15 feet. The existing single lane bridge would be left in place during construction to maintain traffic during construction. Once the replacement bridge is constructed traffic would be switched onto it and the existing bridge would be removed.

Project Location and Setting

Chalk Hill Road is a rural north-south minor collector road. It begins at Pleasant Avenue/Faught Road to the south and proceeds north 8.03 miles to its terminus at State Highway 128 in unincorporated Sonoma County, California. The existing one-lane bridge that carries Chalk Hill Road over Maacama Creek is a Sonoma County landmark eligible for inclusion on the National Register of Historic Places due to its age and unique character.

The project is in a bucolic agricultural region of the County dominated by grape vines, oak trees, hills and mountains in the background. Primary views of the new bridge consist of the roadway and bridge barriers with very limited views of the box girder when approached from the south. Changes in bridge views will be considered

an improvement at best and indifferently at worst because the change in driving experience is limited.

Regulatory Setting

This technical memorandum assesses project-related noise under the requirements of Title 23 Part 772 of the Code of Federal Regulations (23CFR772) and the Caltrans Traffic Noise Analysis Protocol.[1] The memorandum describes the proposed project, existing regulatory and environmental settings, and the potential construction-related noise effects that could result from project implementation.

A Type I project, as defined under section 23CFR772.5, would be a federally-aided highway project involving the construction of a highway in a new location or the physical alteration of an existing highway, which would include significant changes to either the horizontal or vertical alignment, or increases in the number of through-traffic lanes. The improvements proposed by the Chalk Hill Bridge Project do not result in a new highway facility in a new location or substantial horizontal or vertical alterations to the existing roadway alignment, or otherwise meet the definition of the Type I project. Further, activity categories and noise abatement criteria (NAC) would not apply to this project since it would not be considered a Type I project. Therefore, the project does not require an analysis of operational noise or a Noise Study Report.

Fundamentals of Traffic Noise

The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to Caltrans' Technical Noise Supplement (TeNS),[2] a technical supplement to the Protocol that is available on Caltrans' Web site (https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf). Acoustical terms used in this report are summarized in Table 1

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting noise propagation to the receptor determines sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound

[1] California Department of Transportation Division of Environmental Analysis, *Traffic Noise Analysis Protocol: For New Highway Construction, Reconstruction, and Retrofit Barrier Projects,* April 2020.

[2] California Department of Transportation Division of Environmental Analysis, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa.

Table 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m.to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

A-weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make a judgment of the relative loudness or annoyance of a sound, their judgment correlates well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 2 describes typical A-weighted noise levels for various noise sources.

Table 2 Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 miles per hour (mph)		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans 2013.

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be

perceived as barely detectable.

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a one-hour period and is the basis for NAC used by Caltrans and Federal Highway Administration (FHWA).
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as soft dirt, grass, or scattered bushes

and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 decibels per doubling of distance.

Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receptor is rarely effective in reducing noise because it does not create a solid barrier.

Construction Noise

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Construction noise levels vary on a day-to-day basis, depending on the type and amount of equipment operating on-site and the specific task that is being completed on a particular day. Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. Table 3 summarizes the maximum instantaneous noise levels generated by typical construction equipment that generate either non-impact or impacts sounds at a distance of 50 feet from the noise source. The highest maximum noise levels generated by project construction would typically range from about 80 to 90 dBA L_{max} at a distance of 50 feet from the noise source. Extreme noise generating construction methods such as pile driving are not expected for the proposed project. Typical hourly average construction-generated noise levels for various types of projects are summarized in Table 4 at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.).

Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA noise reduction at distant receptors.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction-generated vibration for building damage (Table 5) and human complaints (Table 6). The guidelines in Tables 5 and 6 represent syntheses of

vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving, and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 5 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from "Historic and some old buildings" to "Modern industrial/commercial buildings". Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 6 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Table 3 Construction Equipment, 50-foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes: [1] Measured at 50 feet from the construction equipment, with a “slow” (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3]Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Source: Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances, National Cooperative Highway Research Program, 1999.

Table 4 Hourly Average Noise Levels for Construction Equipment at 50 feet

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

I – All pertinent equipment present at site.

II – Minimum required equipment present at site.

Source: United States Environmental Protection Agency, 1973, Legal Compilation on Noise, Vol. 1, p. 2-104.

Table 5 Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Table 6 Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.035	0.01
Distinctly perceptible	0.24	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Regulatory Criteria – Noise

The proposed project would be subject to noise-related regulations, plans, and policies established within documents prepared by the State of California and Sonoma County. Additionally, daytime noise thresholds established by the Federal Transit Administration would be applicable for the proposed bridge replacement project.

Federal

23 CFR 772

23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for Federal and Federal-aid projects. Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects.

FHWA defines a Type I project as a proposed Federal or Federal-aid project for the construction of a highway or roadway on a new location or the physical alteration of an existing highway, which significantly changes either the horizontal or vertical alignment of the highway. The following projects are also considered to be Type I projects:

- The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, HOT lane, bus lane, or truck climbing lane;
- The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane;
- The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange;
- Restriping existing pavement for the purpose of adding a through traffic lane or an auxiliary lane;
- The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.

If a project is determined to be a Type I project under this definition, the entire project area as defined in the environmental document is a Type I project.

A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

The improvements proposed by the Chalk Hill Bridge Project do not result in a new highway facility in a new

location or substantial horizontal or vertical alterations to the existing roadway alignment, or otherwise meet the definition of the Type I project. Further, activity categories and noise abatement criteria (NAC) would not apply to this project since it would not be considered a Type I project. Therefore, the project does not require an analysis of operational noise or a Noise Study Report.

Federal Transit Administration

Table 7.2 of the Federal Transit Administration's (FTA's) Transit Noise and Vibration Impact Assessment Manual[3] provides daytime and nighttime construction noise criteria based on the type of receiving land use. These thresholds are shown in Table 7.

Table 7 General Assessment Construction Noise Criteria

Land Use	$L_{eq,equip(1hr)}$, dBA	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

State

Noise associated with construction is controlled by Caltrans Standard Specification Section 14-8.02, "Noise Control," which states the following:

- Do not exceed 86 dBA L_{max} at 50 feet from the job site activities from 9:00 p.m. to 6:00 a.m.
- Equip an internal combustion engine with the manufacturer recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

Typically, work taking place within the Caltrans right-of-way is not subject to local noise ordinances; however, Caltrans will work with the contractor to meet local requirements where feasible. If construction noise level is expected to exceed the contract specification criteria or construction noise levels is expected to exceed the ambient (baseline) noise levels, and there are sensitive receptors near the project site construction noise control measures should be considered.

Local

Goals, objectives, and policies designed to protect noise-sensitive uses from exposure to excessive noise are set forth in the Noise Element of the Sonoma General Plan 2020. The primary goal of the Noise Element is to "Protect people from the adverse effects of exposure to excessive noise bad to achieve an environment in which people and land uses function without impairment from noise."

Objectives and policies of the Noise Element that are applicable in the assessment of the proposed project are as follows:

Objective NE-1.1: Provide noise exposure information so that noise impacts may be effectively evaluated in land use planning and project review.

Objective NE-1.2: Develop and implement measures to avoid exposure of people to excessive noise levels.

[3] Federal Transit Administration, "Transit Noise and Vibration Impact Assessment Manual," FTA Report No. 0123, September 2018.

Objective NE-1.3: Protect the present noise environment and prevent intrusion of new noise sources which would substantially alter the noise environment.

Policy NE-1a: Designate areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dB L_{dn}, 60 dB CNEL, or the performance standards of Table NE-2 for non-transportation noise sources (not applicable).

Policy NE-1d: Consider requiring an acoustical analysis prior to approval of any discretionary project involving a potentially significant new noise source or a noise sensitive land use in a noise impacted area.

Regulatory Criteria – Vibration

The *Transportation and Construction Vibration Guidance Manual* (Manual) was published by Caltrans in April 2020 and includes guidance for construction vibration assessment. Tables 5 and 6 of this report summarize the effects on buildings and human reaction, respectively, expected for different vibration levels, as described in the Manual. For structural damage, Caltrans recommends a vibration limit of 0.5 in/sec PPV for new residential structures and modern industrial/commercial buildings, 0.3 in/sec PPV for older residential structures, and a conservative limit of 0.08 in/sec PPV for extremely fragile historic buildings, ruins, and ancient monuments.

Existing Noise Environment

Constructed in 1915, the existing historic bridge carries Chalk Hill Road, which is a two-lane highway, over Maacama Creek approximately 1.25 miles south of Highway 128. This corridor provides access for communities, such as Windsor, Mark West Springs, Larkfield-Wikiup and Santa Rosa, via State Highway 101 (Highway 101) and connects to the rural, agricultural areas of Alexander Valley in Sonoma County, California. Coordinates for the bridge crossing are at 38˚ 37 19"N, 122˚ 46' 25"W.

The noise environment at the site and at receptors in the project vicinity results primarily from Chalk Hill Road traffic. The traffic volume along Chalk Hill Road is relatively low and inconsistent. Seasonally, existing agricultural activities in the area may increase the noise levels, but during the most conservative conditions, most of the background noise would consist of distant traffic, birds, insects, wind, etc.

A noise monitoring survey was not completed to document ambient noise levels in the project vicinity. However, ambient noise measurements made by Illingworth & Rodkin, Inc. in March 2015[4] were used to establish existing noise levels in the surrounding area.

Figure 1 shows the measurement locations made in 2015 with respect to the project site boundaries. The 2015 monitoring survey included two long-term measurements (LT-1 and LT-2) along Chalk Hill Road at Thomas Road. The survey started on Friday, March 6, 2015 and concluded on Tuesday, March 10, 2015. These measurements would represent ambient noise levels at existing residential land uses located along Chalk Hill Road (LT-1) and set back from Chalk Hill Road (LT-2).

The noise survey was made with Larson Davis Model 820 Integrating Sound Level Meters (SLMs) set at “slow” response. The sound level meters were equipped with G.R.A.S. Type 40AQ ½-inch random incidence microphones fitted with windscreens. The sound level meters were calibrated prior to the noise measurements using a Larson Davis Model CAL200 acoustical calibrator. The response of the system was checked after each measurement session and was always found to be within 0.2 dBA. No calibration adjustments were made to the measured sound levels. At the completion of each monitoring event, the measured interval noise level data were obtained from

[4] Illingworth & Rodkin, Inc., “Environmental Noise Assessment Use Permit Modification Vérité Winery 4611 Thomas Road,” April 14, 2015.

the SLM using the Larson Davis SLM utility software program.

Site LT-1 was located approximately 50 feet from the centerline of Chalk Hill Road. Existing ambient day-night average noise levels at LT-1 ranged from 53 to 57 dBA L_{dn}. Site LT-2 was located approximately 315 feet east of Chalk Hill Road along Thomas Road. Existing ambient day-night average noise levels at LT-2 ranged from 46 to 48 dBA L_{dn}.

Table 8 summarizes the highest L_{max} and highest hourly L_{eq} values measured at each LT location for the daytime and nighttime hours. The average L_{max} and L_{eq} values are also shown. The trends in ambient noise levels measured at long-term locations are summarized graphically in Appendix A (Figures A1 and A2).

Figure 1 Project Vicinity and Noise Measurement Locations

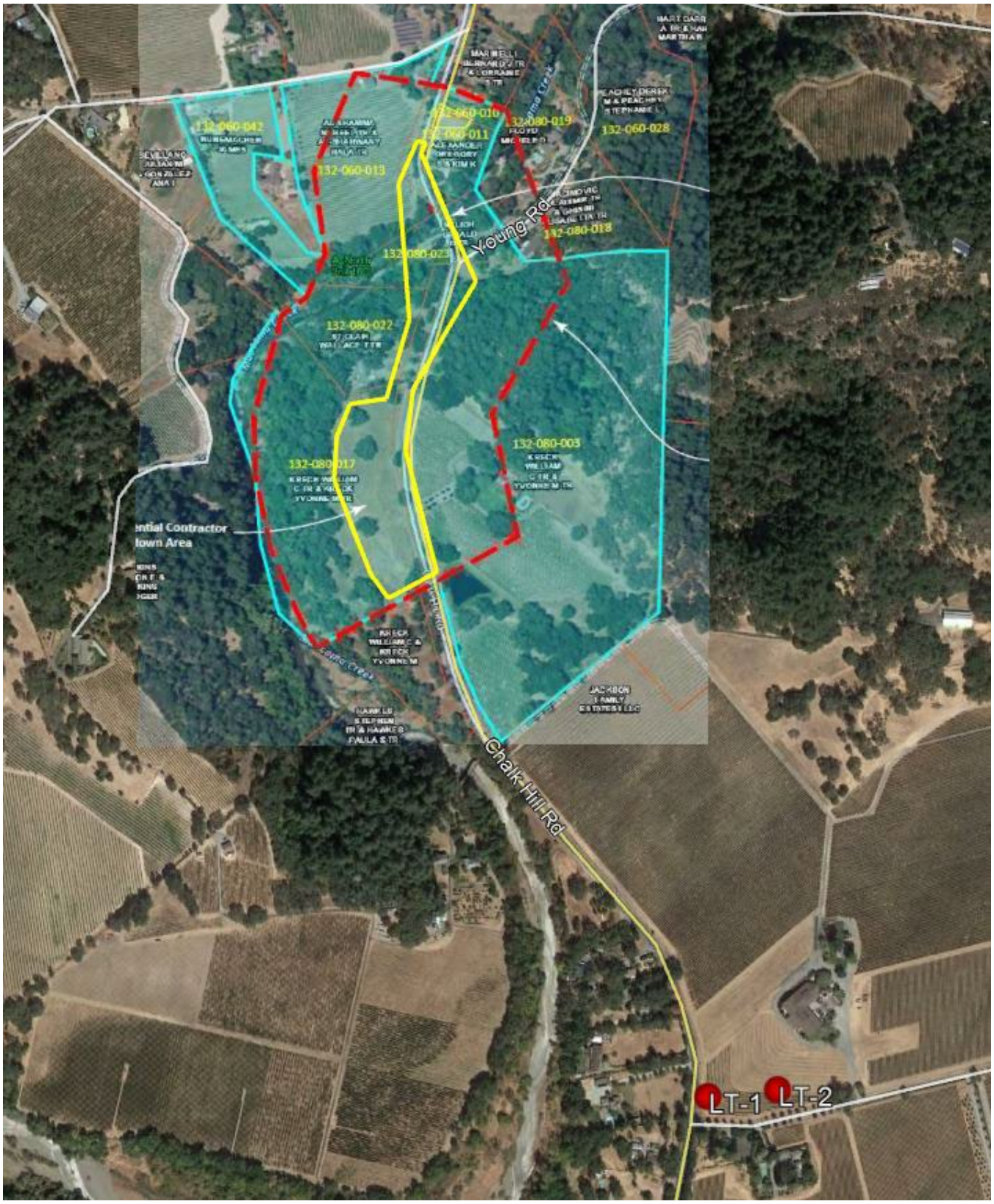


Table 8 Summary of LT Noise Measurements

Noise Measurement Location (Date, Time)	Pertinent Activities	Daytime Hours, 7am-10pm		Nighttime Hours, 10pm-7am	
		L_{max}	L_{eq}	L_{max}	L_{eq}
LT-1: At the northeast corner of the Chalk Hill Road/Thomas Road intersection, 50 feet from the centerline of Chalk Hill Road (3/6/2015, 17:00-3/10/2015, 8:00)	Local traffic and other ambient noise sources	Max = 82 dBA Average = 74 dBA	Max = 60 dBA Average = 53 dBA	Max = 82 dBA Average = 67 dBA	Max = 57 dBA Average = 45 dBA
LT-2: At the northeast corner of the Chalk Hill Road/Thomas Road intersection, 315 feet from the centerline of Chalk Hill Road (3/6/2015, 17:00-3/9/2015, 13:00)	Local traffic and other ambient noise sources	Max = 66 dBA Average = 59 dBA	Max = 53 dBA Average = 43 dBA	Max = 64 dBA Average = 51 dBA	Max = 45 dBA Average = 40 dBA

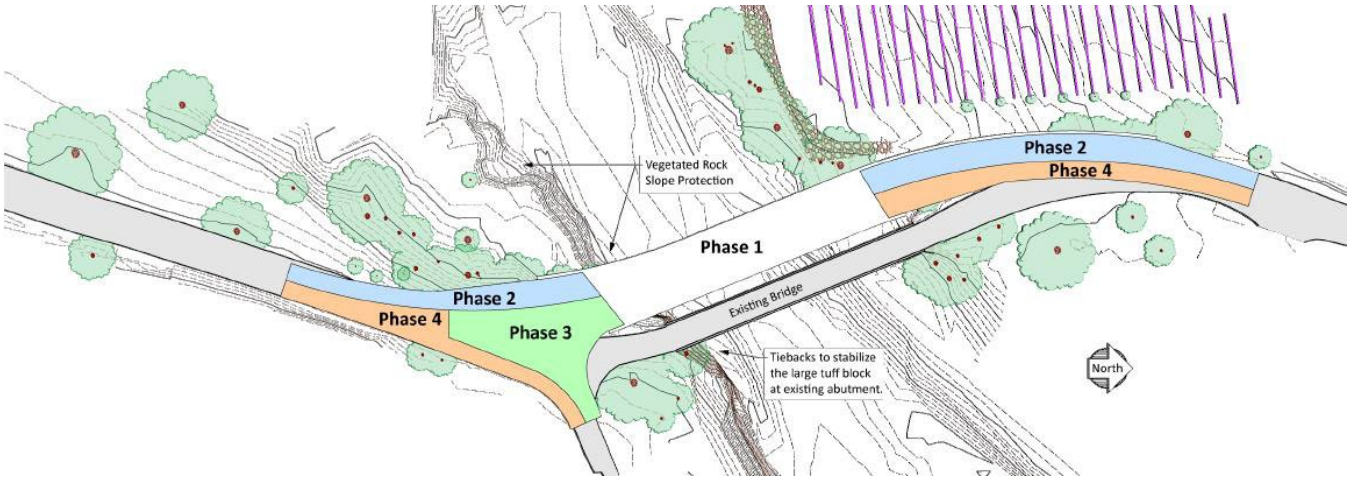
Proposed Project Construction

Two construction years are required to complete this project. The first year shall consist of constructing the new replacement bridge. The existing bridge will be removed, and scour countermeasures implemented in the following year during the dry season.

All construction within the wetted channel is limited to the dry season during low flow months, which would start no sooner than May 15th and end no later than October 31st. Construction beyond the wetted channel is permitted throughout the year with the implementation of stream protections to prevent construction debris and sediments from entering the creek. Unless otherwise specified in applicable permits or the contract specifications, construction hours will be limited to 7:00 a.m. to 7:00 p.m. on weekdays and to 9:00 a.m. to 7:00 p.m. on weekends and holidays.

The sequence of activities during the first year of construction is shown in Figure 2. While complete road closures may be required to tie the new approach roadways to the existing roadways, the closures would be limited to 10 minutes for emergency vehicles and 30 minutes for other vehicles.

Figure 2 Sequence for the First Construction Year



Construction of the new bridge would require generators, air compressors, drill rigs, cranes, excavators, loaders, gravel trucks, concrete trucks, concrete pumps, and other track mounted or wheel mounted equipment and would not require impact or vibratory pile driving, which generate excessive noise and vibration levels.

The proposed project would include 13 phases over two years:

Season 1

- Before the dry season begins:
  - Bridge Abutments
- After the dry season begins:
  - Access Creek Bed
  - Stream Diversion (k-rail) and Creek Bed Protection (clean gravel)
  - Superstructure Falsework
  - Concrete Bridge Construction
- Before the dry season ends:
  - Remove Stream Diversion (k-rail)

- After the dry season ends:
    - Retaining Walls, Approach Roadways & Tie-Ins

Season 2

- Before the dry season begins:
    - Restore Access to Creek Bed
- After the dry season begins:
    - Restore Stream Diversion (k-rail) and Creek Bed Protections (clean gravel)
    - Existing Bridge Demolition
- Before the dry season ends:
    - Remove Stream Diversion (k-rail)
- After the dry season ends:
    - Remove then Re-Vegetate Old Approach Roadways
    - Project Move Out

A Type I project, as defined under section 23CFR772.5, would be a federally-aided highway project involving the construction of a highway in a new location or the physical alteration of an existing highway, which would include significant changes to either the horizontal or vertical alignment, or increases in the number of through-traffic lanes. The improvements proposed by the Chalk Hill Bridge Project do not result in a new highway facility in a new location or substantial horizontal or vertical alterations to the existing roadway alignment, or otherwise meet the definition of the Type I project. Further, activity categories and noise abatement criteria (NAC) would not apply to this project since it would not be considered a Type I project. Therefore, the project does not require an analysis of operational noise or a Noise Study Report.

Construction Noise Assessment

Construction noise would primarily result from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks. FHWA's Roadway Construction Noise Model (RCNM) was used to calculate the maximum and hourly average noise levels anticipated for the worst-case scenario. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power.

For each phase shown above, a list of construction equipment expected to be used at various times throughout the phase was provided. This equipment is summarized in Table 9, as well as the estimated hourly average noise level and maximum noise level for each phase. While it is unlikely that every piece of equipment would be operating simultaneously, multiple pieces would be expected to be used at any given time. To estimate the worst-case scenario, the five loudest pieces of equipment per phase were assumed to be operating simultaneously, generating a combined loudest hourly average noise level at a distance of 50 feet computed using an energy summation. The maximum instantaneous noise level shown for each phase represents that maximum noise level for the loudest piece of equipment at a distance of 50 feet. All mobile equipment will be fitted with backup alarms per OSHA requirements. The noise level of backup alarms can vary depending on the type and directivity of the sound, but maximum noise levels are typically in the range of 65 to 75 dBA L_{max} at a distance of 50 feet. Because equipment counts were not included in the provided equipment list, it is assumed that one of each piece of equipment will be used during each phase.

Table 9 Summary of Construction Noise Modeling Source Levels at a Distance of 50 feet

Activity	Equipment	L_{max}[a] (dBA)	L_{eq}[b] (dBA)
Season 1			
Bridge Abutments	Chain Saw/Tree Felling Excavator or Backhoe Tractor Trailer Drilling Equipment Crane Concrete Pump/Boom Truck Concrete Mixing Truck Excavation Water Pump Loader Roller/Sheep's Foot Plate Tamper/Wacker/Ram Pickup Truck Water Truck Dump Truck Street Sweeper Generator Air Compressor Telescopic Forklift Cutting Torch, Circular Saw, Drill Grinder	84	84
Access to Creek Bed	Chain Saw/Tree Felling Excavator or Backhoe Loader Dump Truck Roller/Sheep's Foot Water Truck Pickup Truck Street Sweeper	84	82

Activity	Equipment	L_{max}[a] (dBA)	L_{eq}[b] (dBA)
Stream Diversion and Creek Bed Protection	Crane Loader Excavator or Backhoe Telescopic Forklift Dump Truck Pickup Truck Scraper/Spreader Water Truck Tractor Trailer	84	83
Superstructure Falsework	Crane Loader Engine Powered Boom Lift Generator Air Compressor Pickup Truck Tractor Trailer Telescopic Forklift Cutting Torch, Circular Saw, Drill Grinder	81	82
Concrete Bridge Construction	Crane Generator Air Compressor Concrete Pumps/Boom Truck Engine Powered Boom Lift Roller/Sheep's Foot Plate Tamper/Wacker/Ram Pickup Truck Water Truck Street Sweeper Concrete Vibrator Loader Tractor Trailer Telescopic Forklift Hydraulic Pump/Strand Jack Grout Mixer/Pump Cutting Torch, Circular Saw, Drill Grinder	83	84

Activity	Equipment	L_{max}[a] (dBA)	L_{eq}[b] (dBA)
Remove Stream Diversion	Crane Loader Telescopic Forklift Pickup Truck Water Truck Tractor Trailer	81	80
Retaining Walls, Approach Roadways and Tie-Ins	Loader Excavator or Backhoe Profile Grinder Paver Dump Truck Roller Plate Tamper/Wacker/Ram Street Sweeper Generator Air Compressor Pickup Truck Water Truck Tractor Trailer Telescopic Forklift Thermoplastic Applicator Auger for Wood Signpost Cutting Torch, Circular Saw, Drill Grinder	90	87
Season 2			
Restore Access to Creek Bed	Excavator or Backhoe Loader Dump Truck Roller/Sheep's Foot Water Truck Pickup Truck Street Sweeper	82	82

Activity	Equipment	L_{max}[a] (dBA)	L_{eq}[b] (dBA)
Restore Stream Diversion and Creek Bed Protection	Crane Loader Excavator or Backhoe Telescopic Forklift Dump Truck Pickup Truck Scraper/Spreader Water Truck Tractor Trailer	84	83
Existing Bridge Demolition	Crane Loader Engine Powered Boom Lift Excavator or Backhoe Excavator-Mounted Hydraulic Hammer Generator Air Compressor Pickup Truck Dump Truck Water Truck Street Sweeper Tractor Trailer Telescopic Forklift Cutting Torch, Circular Saw, Drill Grinder	90	86
Remove Stream Diversion	Crane Loader Telescopic Forklift Pickup Truck Water Truck Tractor Trailer	81	80

Activity	Equipment	L_{max}[a] (dBA)	L_{eq}[b] (dBA)
Remove and Re-Vegetate Old Approach Roadways	Excavator or Backhoe Loader Dump Truck Bulldozer/Ripper Scraper/Spreader Pickup Truck Water Truck Tractor Trailer	84	84
Project Move Out	Street Sweeper Water Truck Pickup Truck Dump Truck Telescopic Forklift	82	79

[a] L_{max} noise levels are the maximum instantaneous noise level for the loudest individual piece of equipment.

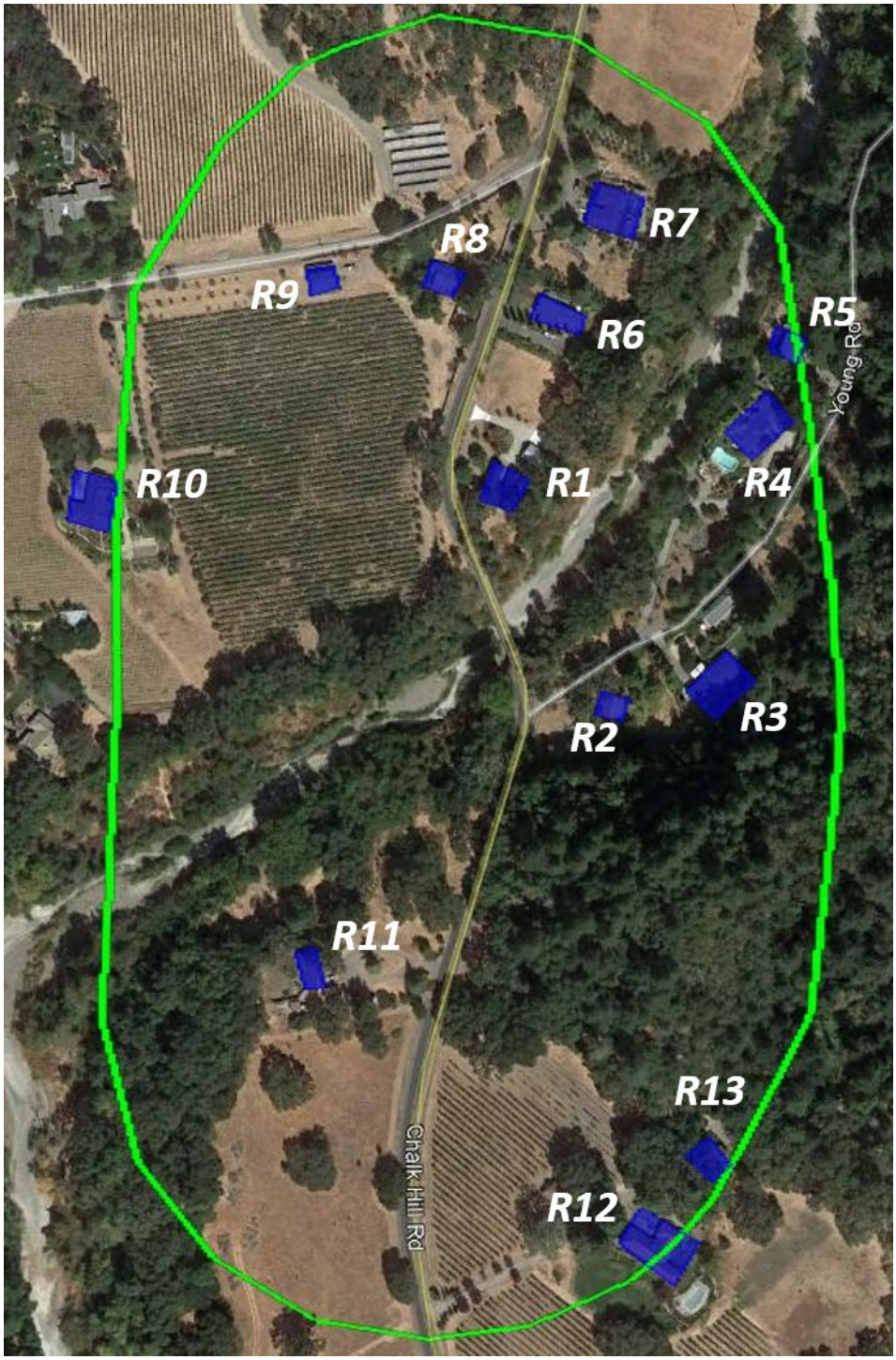
[b] L_{eq} noise levels are the hourly average noise level for the five loudest pieces of equipment combined.

For the sensitive receptors adjacent to the project site to the north and east (residences), construction noise control measures should be considered if construction noise is expected to exceed the contract specification criteria. The modeled results for L_{max} and L_{eq}, which are summarized in Table 9 for the worst-case scenario construction noise levels expected for the proposed project during each phase of construction, would range from 81 to 90 dBA L_{max} and from 79 to 87 dBA L_{eq}, as measured at a distance of 50 feet from the center of the project site. While the Caltrans nighttime threshold of 86 dBA L_{max} would be exceeded during the Retaining Walls and Approach Roadways and Tie-Ins and Existing Bridge Demolition phases, project construction hours would be limited to between 7:00 a.m. and 7:00 p.m. Therefore, the Caltrans noise threshold would not be applicable.

The Sonoma County General Plan does not establish a noise threshold for construction activities. Therefore, the FTA's daytime threshold of 90 dBA L_{eq} would be applied to all residential land uses within 500 feet of the bridge construction area.

The modeled noise levels summarized in Table 9 could be centered at any location throughout the project site. Construction work for the proposed project would mostly occur at the bridge. To estimate the worst-case construction noise, the levels in Table 9 were positioned at the center of bridge and propagated to the nearest noise-sensitive receptors located within 500 feet of the bridge. These receptors are highlighted blue in Figure 3, with the green line representing the 500-foot boundary. For estimating worst-case construction noise, the L_{max} and L_{eq} levels in Table 9 were propagated to the center of the outdoor use area of individual residences using the 6 dB per doubling of the distance fall-off rate. The estimated noise levels at each receptor are summarized for each phase in Table 10.

Figure 3 Receptors Located Within 500 feet of the Improvements to the Roadway Alignment



Based on the results in Table 10, the nearest noise-sensitive receptors would not be exposed to temporary construction noise in excess of the FTA's 90 dBA L_{eq} exterior noise threshold; however, existing ambient conditions would be exceeded by more than 5 dBA L_{eq} at times throughout construction.

Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction material, are necessary to protect the health and safety of persons,

promote the general welfare of the community, and maintain the quality of life. Construction activities are expected between 7:00 a.m. and 7:00 p.m. on weekdays and between 9:00 a.m. and 7:00 p.m. on weekends and holidays. Sonoma County has developed a *Guidelines for the Preparation of Noise Analysis* (Guidelines)[5] document, which requires implementation of measures to reduce construction noise levels if a project takes longer than one year to complete; if a project requires pile driving; or if a project located within 600 feet for noise-sensitive uses would involve nighttime work (between 10:00 p.m. and 7:00 a.m.). The Guidelines further state that while little can be done to reduce noise levels generated by construction equipment, measures should be considered in cases where sensitive receptors may be impacted. Since the proposed project would take longer than one year to complete, the project shall incorporate the following measures to reduce noise levels as much as possible:

- Limiting hours of construction to avoid the early morning and evening hours (such as 7:00 a.m. to 7:00 p.m. weekdays and 7:00 a.m. to 5:00 p.m. weekends). While the proposed project construction hours would lie outside these recommended hours, approval from the County should be obtained prior to work commencing.
- Limiting work to non-motorized equipment on Sundays and holidays.
- Using sound blankets for loud operations, such as pile driving, air compressors or other mechanical equipment, and consider pre-drilling holes prior to pile driving.
- Siting construction staging areas as far as practical from nearby sensitive receptors.
- Require street legal mufflers on all construction equipment.

Due to the length of the proposed construction project, the close proximity to residential land uses, and the noisy equipment proposed at the site, the construction crew shall be required to adhere to the following construction best management practices to further reduce construction noise levels emanating from the site and minimize disruption and annoyance at existing noise-sensitive receptors in the project vicinity.

Construction Best Management Practices

Develop a construction noise control plan, including, but not limited to, the following construction best management controls:

- Construct solid plywood fences along the construction site boundaries. Residences R1 and R2 are located in close proximity to project boundary and constructing a temporary noise barrier fences to shield these receptors would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receptor and if the barrier is constructed in a manner that eliminates any cracks or gaps. For this project, a minimum height of 8 feet for the temporary barrier should be used.
- Except as provided herein, impact tools (e.g., jackhammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.
- Stage large equipment, compressors, or generators at least 25 feet from the site perimeters located near residences R1 and R2 when work is not being done near these residences.

[5] County of Sonoma, Permit Sonoma, "Guidelines for the Preparation of Noise Analysis," version 2, February 2019.

- Construction activities should be conducted in a manner that minimizes the noise impact at the adjacent property boundaries wherever possible. Construction equipment shall be positioned as far from noise-sensitive receptors as possible.
- Unnecessary idling of internal combustion engines should be strictly prohibited.
- Prohibit noise from construction workers' stereos or other music devices.
- Designate an on-site "disturbance coordinator," who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will maintain a complaint log, which shall include complaints received, the cause of the noise complaints (e.g., bad muffler, etc.), and how the noise complaint was addressed. Conspicuously post a large sign with information regarding the construction days/hours, complaint procedures, and telephone number for the disturbance coordinator and County Code Enforcement unit at the construction site.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.

The implementation of the measures provided in the Guidelines and the construction best management practices outlined above would reduce construction noise levels emanating from the site by about 5 dBA. Considering the noisiest phases of the project would be limited to between May 15th and October 31st, the implementation of these measures would minimize disruption and annoyance to residents in the project vicinity.

Table 10 **Summary of Construction Noise Levels Estimated at the Center of the Outdoor Use Areas for All Receptors Located within 500 feet of the Construction Alignment (Worst-Case Scenario)**

	Receptor (Propagation Distance, feet)	Average Daytime Ambient Noise Levels (dBA)		Estimated Construction Noise Levels (dBA)	
		L_{max}	L_{eq}	L_{max}	L_{eq}
Season 1	R1 (150 feet)	74	53	71 to 80	71 to 78
	R2 (200 feet)	74	53	69 to 78	68 to 75
	R3 (325 feet)	59	43	64 to 73	64 to 71
	R4 (420 feet)	59	43	62 to 71	62 to 69
	R5 (580 feet)	59	43	59 to 68	59 to 66
	R6 (465 feet)	74	53	61 to 70	61 to 68
	R7 (590 feet)	74	53	59 to 68	59 to 66
	R8 (480 feet)	74	53	61 to 70	60 to 68
	R9 (560 feet)	59	43	60 to 69	59 to 66
	R10 (540 feet)	59	43	60 to 69	59 to 67
	R11 (495 feet)	59	43	61 to 70	60 to 67
	R12 (1,000 feet)	59	43	55 to 64	54 to 61
	R13 (830 feet)	59	43	56 to 65	56 to 63
Season 2	R1 (150 feet)	74	53	72 to 81	70 to 76
	R2 (200 feet)	74	53	69 to 78	67 to 74
	R3 (325 feet)	59	43	65 to 74	63 to 70
	R4 (420 feet)	59	43	63 to 72	61 to 67
	R5 (580 feet)	59	43	60 to 69	58 to 65
	R6 (465 feet)	74	53	62 to 71	60 to 66

	Receptor (Propagation Distance, feet)	Average Daytime Ambient Noise Levels (dBA)		Estimated Construction Noise Levels (dBA)	
		L_{max}	L_{eq}	L_{max}	L_{eq}
	R7 (590 feet)	74	53	60 to 69	58 to 65
	R8 (480 feet)	74	53	62 to 71	60 to 66
	R9 (560 feet)	59	43	60 to 69	58 to 65
	R10 (540 feet)	59	43	61 to 70	59 to 65
	R11 (495 feet)	59	43	62 to 70	59 to 66
	R12 (1,000 feet)	59	43	55 to 64	53 to 60
	R13 (830 feet)	59	43	57 to 66	55 to 61

Construction Vibration Assessment

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include demolition/excavation, underground utilities, concrete/asphalt placement, portable building, and delineation and landscaping. The proposed project is not expected to require pile driving, which can cause excessive vibration. Instead, a cast-in-drilled-hole method will be utilized to install the piles. Critical factors pertaining to the impact of construction vibration on sensitive receptors include the proximity of the existing structures to the project site, the soundness of the structures, and the methods of construction used.

For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for new residential structures and modern industrial/commercial buildings, 0.3 in/sec PPV for older residential structures, and a conservative limit of 0.08 in/sec PPV for extremely fragile historic buildings, ruins, and ancient monuments. No known historical buildings adjoin the project area. Therefore, conservatively, groundborne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact.

Table 11 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. While specific equipment listed in Table 9 for the proposed project may not be included in Table 11, all vibration levels for each piece of equipment expected to be used in the proposed project would be represented by the vibration levels summarized in Table 11, falling within the range of 0.003 and 0.210 in/sec PPV at a distance of 25 feet. Vibration levels perceived at receptors would vary depending on soil conditions, construction methods, and equipment used. Table 11 also summarizes the distances to the 0.3 in/sec PPV threshold for all nonhistorical buildings.

The nearest residences (R1 and R2) to the bridge work, which are identified Figure 3, are approximately 30 to 80 feet from where the potential construction equipment could be used along the roadway alignment. At 30 feet, vibration levels would range from 0.002 to 0.172 in/sec PPV, which would be below the 0.3 in/sec PPV threshold. As summarized in Table 6, these levels would range from barely perceptible to strongly perceptible; however, damage to the structures would not be expected.

All other residential dwellings would be 195 feet or more from the project alignment. At 195 feet, vibration levels would be up to 0.022 in/sec PPV. Vibration levels would be barely perceptible and would not result in damage to the structure.

Construction vibration would at times potentially be barely to strongly perceptible to the occupants of the residential buildings located within 200 feet of the project alignment. However, the construction-generated vibration levels for the proposed project would not result in cosmetic damage (e.g., hairline cracks in plaster, opening of old cracks, etc.) at these dwellings. No vibration control measures would be required to reduce vibration levels.

Table 11 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 feet (in/sec)	Minimum Distance to Meet 0.3 in/sec PPV (feet)
Clam shovel drop		0.202	18
Hydromill (slurry wall)	In soil	0.008	1
	In rock	0.017	2
Vibratory roller		0.210	19
Hoe ram		0.089	9
Large bulldozer		0.089	9
Caisson drilling		0.089	9
Loaded trucks		0.076	8
Jackhammer		0.035	4
Small bulldozer		0.003	<1

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., March 2021.

Sincerely,

Sonoma County Transportation & Public Works

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cc: Nader Dahu, Engineering Division Manager

Appendix A

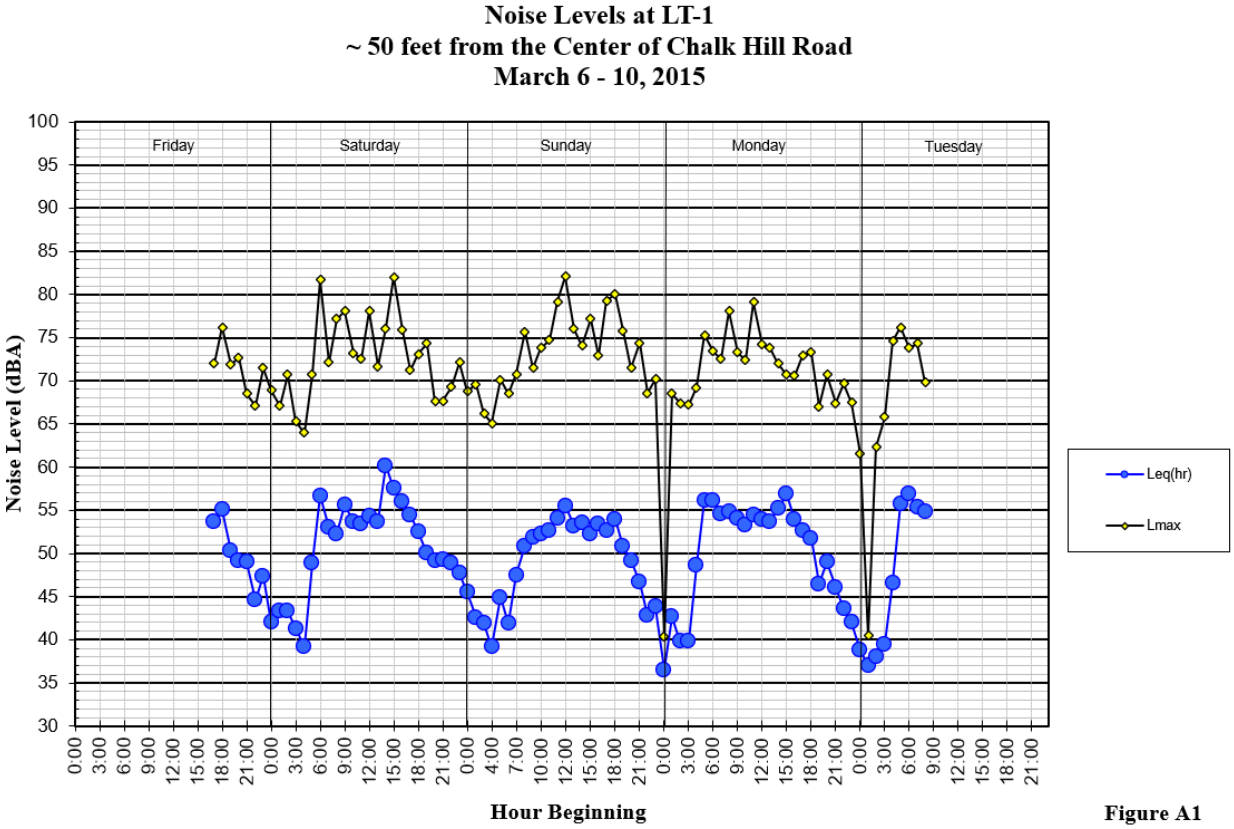


Figure A1

Noise Levels at LT-2
~ 315 feet from the Center of Chalk Hill Road along Thomas Road
March 6 - 9, 2015

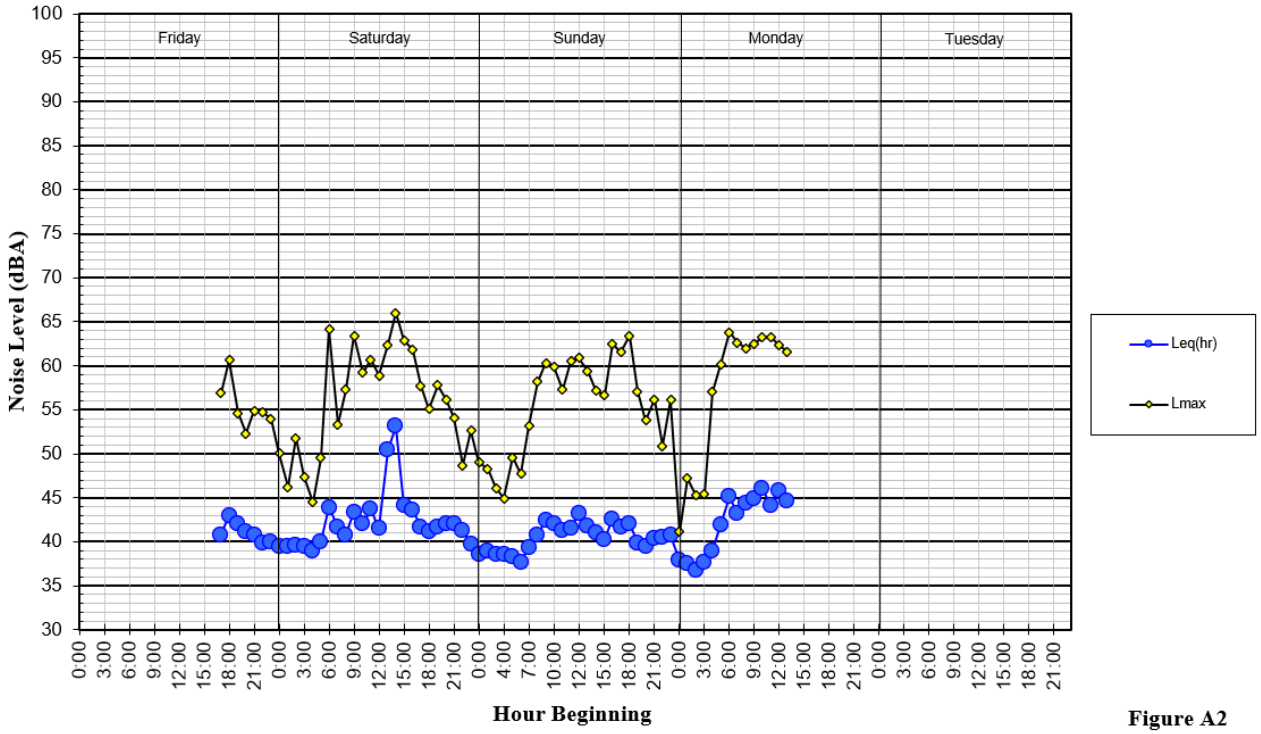


Figure A2