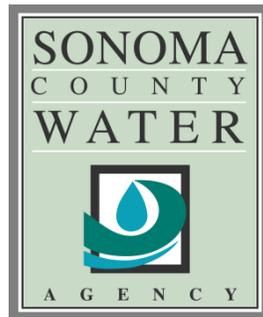


Zones 2A and 3A Natural Channels Maintenance Project:

Initial Study and Negative Declaration of Environmental Impact

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1.0 Introduction

The Sonoma County Water Agency (Water Agency) is proposing the Zones 2A and 3A Natural Channels Maintenance Project (Proposed Project). This stream maintenance project is intended to provide a programmatic approach to watershed management that is biologically beneficial along streams and to provide a flood control service to private landowners and the public in the Water Agency's Flood Control Zones 2A and 3A. These zones were defined in the Water Agency's Stream Maintenance Program (SMP) Manual prepared in 2009 and include the Petaluma area (2A) and upper Sonoma Valley (3A). The Proposed Project would allow for small-scale flood control maintenance activities within streams not currently included in the SMP.

The Water Agency prepared this Initial Study and Negative Declaration for the Proposed Project. The Water Agency is the lead agency in accordance with the California Environmental Quality Act (CEQA). An Initial Study is a preliminary analysis of a project's potential environmental impacts used to determine whether a Negative Declaration or an Environmental Impact Report will be prepared. This document is intended to provide a clear understanding of the environmental impacts associated with the construction, maintenance, and operation of the Proposed Project for decision-makers, responsible and trustee agencies under CEQA, and the public. If an Initial Study identifies no potentially significant impacts, a Negative Declaration may be prepared. Also, if an Initial Study identifies potentially significant impacts, but the project is modified or revised to clearly mitigate the impacts, a Mitigated Negative Declaration may be prepared. If an Initial Study concludes that a project may have a significant effect on the environment, an Environmental Impact Report should be prepared.

Project Background

Water Agency History

The Water Agency was created in 1949 by the California Legislature as a special district to provide flood protection and water supply services. The Sonoma County Board of Supervisors acts as the Water Agency's Board of Directors. The Water Agency's powers and duties, as authorized by the California Legislature, include the production and supply of surface water and groundwater for beneficial uses, control of flood waters, generation of electricity, providing recreational opportunities (in connection with the Water Agency's facilities), and the treatment and disposal of wastewater.

In 1958, under the authority of the Water Agency's enabling legislation, the formation of nine geographical zones, each encompassing major watersheds, was proposed as a means of financing the construction and maintenance of flood protection works within Sonoma County. Nine zones were designated, including: Zone 2A Petaluma River

watershed and Zone 3A Valley of the Moon watershed (Upper Sonoma Creek watershed) that are part of the Proposed Project (Figures 1 and 2). Natural stream channels within these two zones are included in the Proposed Project, except those engineered stream channels that are included in the SMP.

The Water Agency's annual notification and reporting framework for the SMP was used as a model to develop the Proposed Project. The SMP is a programmatic approach to improve and define flood control management and maintenance activities performed by the Water Agency in Sonoma County. The Water Agency's approach and perspective toward stream maintenance has changed from basic flood control and channel maintenance to integrated resource protection and environmental sustainability. The SMP was created in collaboration with state and federal resource agencies.

The SMP also provides the organizational framework to oversee routine channel maintenance activities and ensure the program is compliant with the terms and conditions of its permits. Most of the SMP activities are in engineered stream channels located in urban centers in Sonoma County. The Water Agency owns in fee or has easements to maintain these channels.

In comparison to the SMP, the Proposed Project would be implemented primarily on private lands, largely in rural areas, and consist of small-scale flood control maintenance activities. Flood concerns from private landowners brought to the attention of the Water Agency would be evaluated and considered for maintenance.

The Proposed Project would improve compliance with environmental regulations by providing a mechanism for private property owners to address flood control problems in accordance with an approved set of Best Management Practices (BMPs) developed and implemented by the Water Agency. At the request of a private property owner, the Water Agency would conduct maintenance activities consistent with regulatory requirements. Without such a mechanism in place, property owners frequently either do nothing or perform such activities on their own without incorporating appropriate BMPs. This occurs because either the typical property owner is unaware of current regulations or the permitting process is too onerous or expensive.

2.0 Project Description

Neglected or inadequately-addressed flood control issues on private lands often result in damage to the environment and private property. The Proposed Project would minimize some rural flood concerns and benefit watershed processes by implementing an approved set of Best Management Practices (BMPs). The Proposed Project would implement small-scale flood control activities primarily on properties under private

ownership in the Petaluma and upper Sonoma Creek watersheds, which are not included in the Water Agency's SMP. The Water Agency is not proposing to conduct large-scale mechanical sediment removal from streambeds or large-scale engineered bank stabilization activities under the Proposed Project. Most maintenance activities would be preventative actions to reduce flood risk and avoid bank erosion or other environmental damage. The Project Area consists of creeks generally located in rural areas outside of urban centers (Figures 1 and 2; Table 1).

Maintenance work would typically occur at the request of a landowner who has observed a hydraulic blockage that is causing (or likely to cause) bank erosion. The Water Agency would then evaluate the site and determine if maintenance is needed and could be completed under the scope and criteria described below. Projects not considered suitable candidates include, but are not limited to, those requiring instream sediment removal, bank armament using riprap, and any project with significant and unavoidable impacts to threatened and endangered species (Table 2).

Maintenance activities within engineered and modified channels currently covered by the Water Agency's SMP are not included in the Proposed Project. Under existing SMP authorizations, any planned or requested maintenance work in creeks outside the scope of the SMP requires individual permits from each regulatory agency (California Department of Fish and Wildlife [CDFW], California Regional Water Quality Control Boards [Regions 1 or 2], U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service [USFWS], and National Marine Fisheries Service [NMFS]) prior to maintenance activities. The Proposed Project would provide permit coverage for small-scale flood control maintenance outside of the scope of the SMP.

Proposed maintenance activities consist of vegetation management and bank erosion protection. It is anticipated that approximately 5-10 vegetation maintenance projects and 2-3 erosion protection projects would be conducted annually. Each erosion protection project would be limited to 10 cubic yards of excavated material and to a linear stream bank length of 200 feet. Vegetation removal along banks would not exceed 100 contiguous feet. Although the exact number of maintenance activities is dependent on

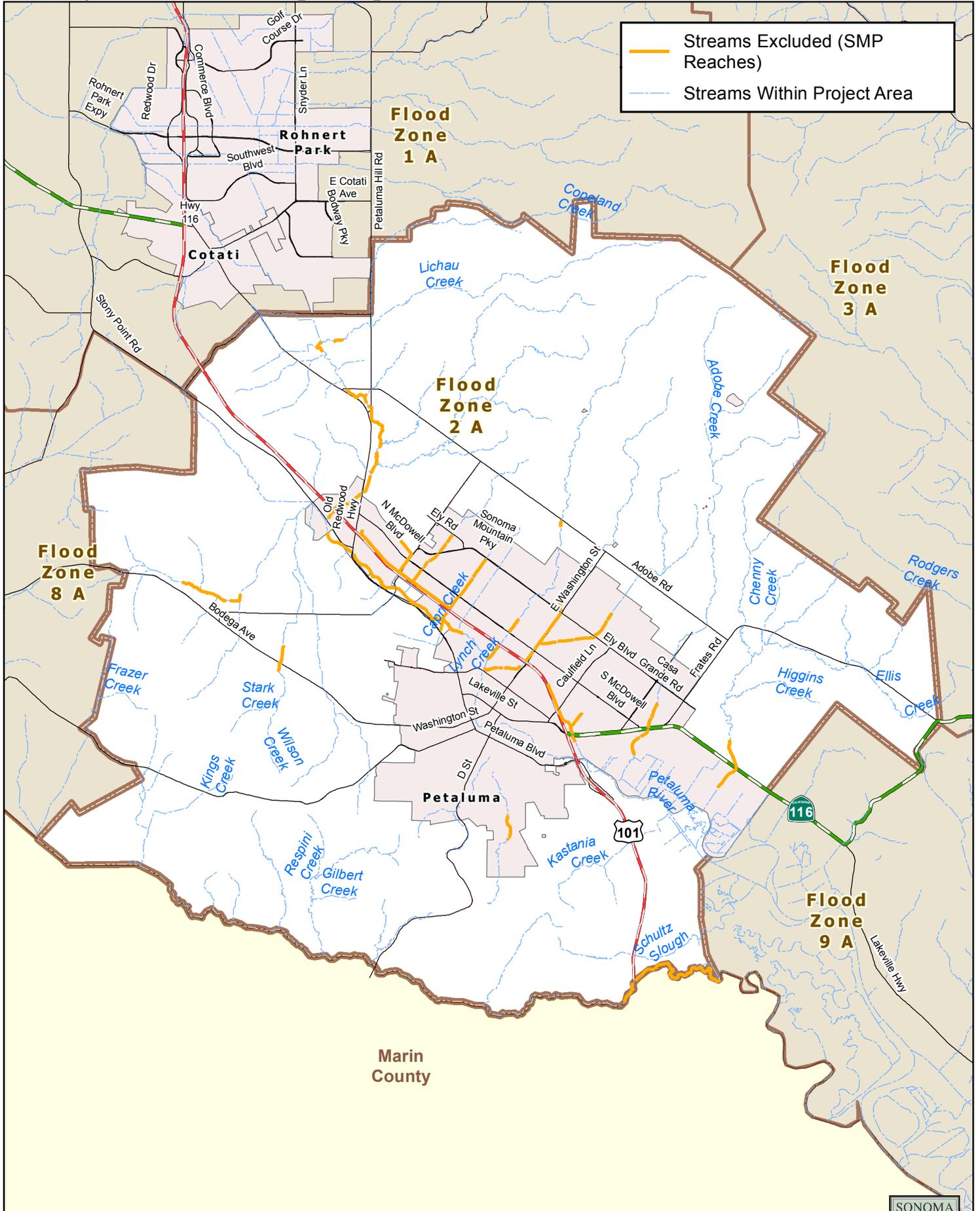
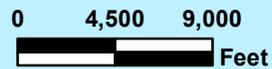


Figure 1: Zone 2A Streams

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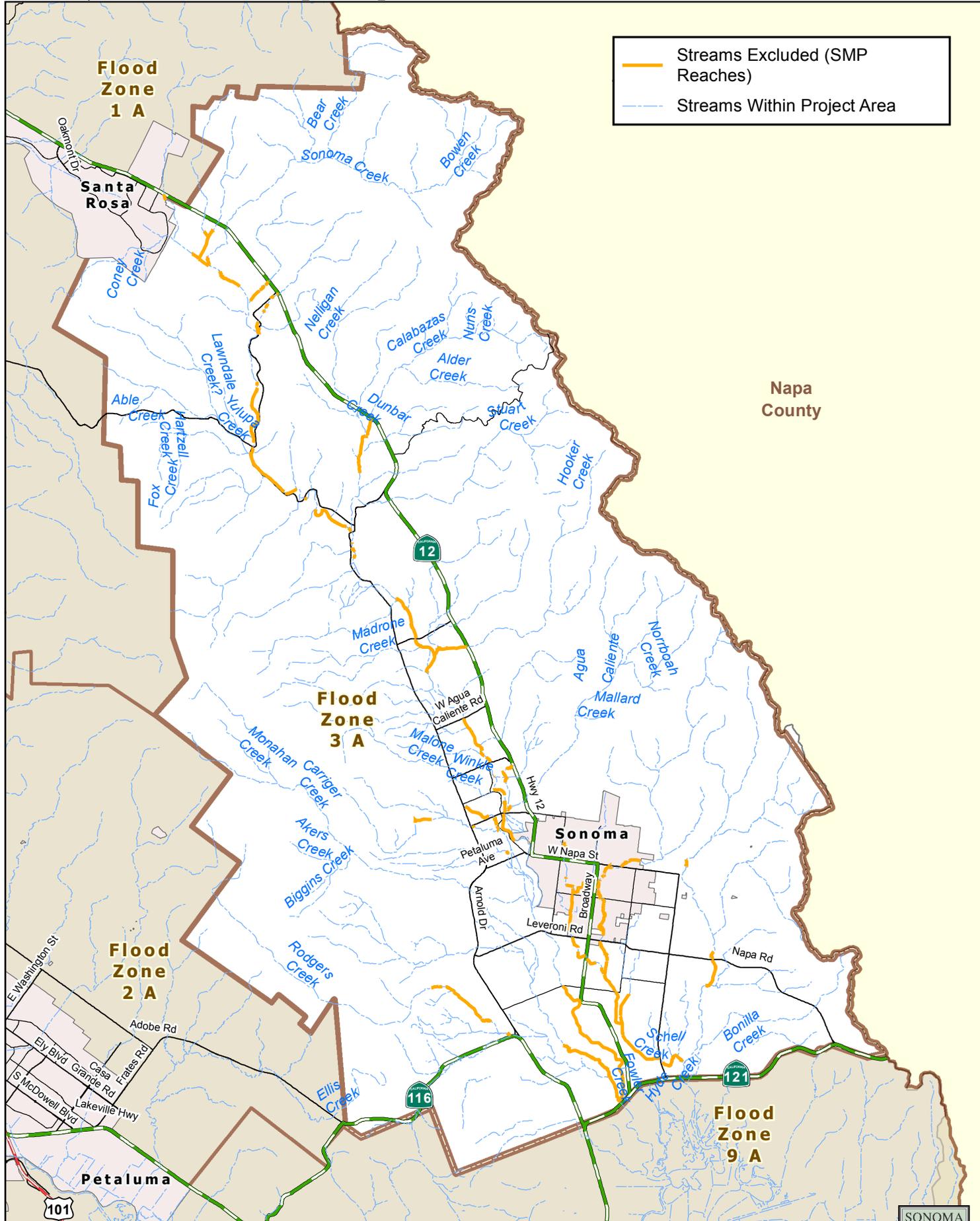


Figure 2: Zone 3A Streams

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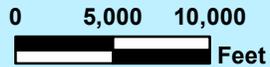


Table 1: Natural channel reaches within Zones 2A and 3A potentially subject to maintenance activities.

| Name | Project Reach (mi) ¹ | Stream Total Length (mi) |
|------------------------|---------------------------------|--------------------------|
| Zone 2A | | |
| ADOBE CREEK | 7.0 | 7.8 |
| ARMSTRONG CREEK | 2.8 | 2.8 |
| BAILEY CREEK | 0.7 | 0.7 |
| CAMERON CREEK | 1.0 | 1.0 |
| CAPRI CREEK | 0.8 | 1.7 |
| CHENNY CREEK | 1.6 | 1.6 |
| CINNABAR CREEK | 0.4 | 0.4 |
| COAL MINE CREEK | 0.3 | 0.3 |
| CORONA CREEK | 1.8 | 3.1 |
| CORONA CREEK TRIBUTARY | 0.3 | 2.1 |
| DAVIS CREEK | 3.3 | 3.3 |
| DAVIS LANE CREEK | 2.0 | 2.0 |
| DEER CREEK | 1.4 | 1.4 |
| EAST WASHINGTON CREEK | 2.8 | 3.9 |
| ELLIS CREEK | 7.9 | 8.7 |
| FINCH CREEK | 0.9 | 0.9 |
| FORMSCHLAG CREEK | 0.4 | 0.4 |
| FRATES CREEK | 0.7 | 0.7 |
| FRAZER CREEK | 0.8 | 0.8 |
| FREEMAN CREEK | 0.5 | 0.5 |
| GIBSON CREEK | 1.4 | 1.4 |
| GILBERT CREEK | 0.7 | 0.7 |
| GREGORY CREEK | 1.6 | 1.6 |
| HARDIN CREEK | 1.1 | 1.1 |
| HARRIS CREEK | 2.0 | 2.0 |
| HIGGINS CREEK | 1.7 | 1.7 |
| HIGHLAND CREEK | 1.1 | 1.1 |
| HUTCHINSON CREEK | 2.3 | 2.3 |
| JESSIE LANE CREEK | 0.8 | 1.0 |
| KASTANIA CREEK | 2.1 | 2.1 |
| KELLYE CREEK | 1.1 | 1.1 |
| KINGS CREEK | 1.5 | 1.5 |
| KIZER CREEK | 1.7 | 1.7 |
| LAFFERTY CREEK | 1.8 | 1.8 |
| LICHAU CREEK | 6.5 | 9.0 |
| LOWER LICHAU CREEK | 1.0 | 1.0 |
| LYNCH CREEK | 6.7 | 7.2 |
| MARIN CREEK | 4.6 | 4.6 |
| MARSHALL CREEK | 1.8 | 1.8 |

Table 1: Natural channel reaches within Zones 2A and 3A potentially subject to maintenance activities.

| Name | Project Reach (mi) ¹ | Stream Total Length (mi) |
|--------------------|---------------------------------|--------------------------|
| MARTINONI CREEK | 1.2 | 1.2 |
| MCBROWN CREEK | 0.8 | 0.8 |
| MCCOY CREEK | 1.2 | 1.2 |
| MCDOWELL CREEK | 0.3 | 1.2 |
| MEACHAM CREEK | 1.3 | 1.3 |
| MORISSON CREEK | 0.8 | 0.8 |
| NORIAN CREEK | 0.5 | 0.5 |
| ORCHARD CREEK | 1.0 | 1.0 |
| OWENS CREEK | 1.0 | 1.0 |
| PALM CREEK | 0.4 | 0.4 |
| PETALUMA RIVER | 20.4 | 22.8 |
| PUTNAM CREEK | 1.2 | 1.2 |
| RAILROAD CREEK | 2.5 | 2.5 |
| RAY CREEK | 1.5 | 1.5 |
| REID CREEK | 1.1 | 1.1 |
| RESPINI CREEK | 1.0 | 1.0 |
| ROBERTS CREEK | 3.0 | 3.0 |
| SAN ANTONIO CREEK | 13.2 | 15.2 |
| SCHIFFINGTON CREEK | 1.4 | 1.4 |
| SCHULTZ CREEK | 1.7 | 1.7 |
| SCHULTZ SLOUGH | 1.1 | 1.1 |
| SKILLMAN CREEK | 0.5 | 0.5 |
| SPEER CREEK | 1.9 | 1.9 |
| SPRING HILL CREEK | 1.3 | 1.3 |
| STAPLETON CREEK | 0.7 | 0.7 |
| STARK CREEK | 0.8 | 0.8 |
| SUTTON CREEK | 0.6 | 0.6 |
| THOMPSON CREEK | 3.8 | 4.1 |
| VISTA CREEK | 0.8 | 0.8 |
| WASHINGTON CREEK | 4.3 | 5.8 |
| WAUGH CREEK | 1.4 | 1.4 |
| WEISE CREEK | 0.7 | 0.7 |
| WIGGINS HILL CREEK | 3.2 | 4.1 |
| WILLIGAR CREEK | 0.7 | 0.7 |
| WILLOW BROOK CREEK | 5.8 | 5.8 |
| WILSON CREEK | 4.4 | 4.7 |
| ZIMMERMAN CREEK | 2.1 | 2.1 |
| ZONE 3A | | |
| ABLE CREEK | 0.7 | 0.7 |
| AGUA CALIENTE | 4.9 | 5.0 |

Table 1: Natural channel reaches within Zones 2A and 3A potentially subject to maintenance activities.

| Name | Project Reach (mi)¹ | Stream Total Length (mi) |
|---------------------|---------------------------------------|---------------------------------|
| AKERS CREEK | 2.2 | 2.2 |
| ALDER CREEK | 2.1 | 2.1 |
| ANELLA CREEK | 1.9 | 1.9 |
| ANNADEL CREEK | 2.0 | 2.0 |
| ARROWHEAD CREEK | 1.5 | 1.5 |
| ARROYO SECO CREEK | 6.3 | 7.0 |
| ASBURY CREEK | 2.4 | 2.4 |
| BAIN CREEK | 1.6 | 1.6 |
| BALD CREEK | 0.7 | 0.7 |
| BARNEY CREEK | 0.9 | 0.9 |
| BARTHOLOMEW CREEK | 1.7 | 1.7 |
| BEAR CREEK | 2.5 | 2.5 |
| BEASLY CREEK | 0.6 | 0.6 |
| BIBLE CREEK | 0.6 | 0.6 |
| BIGGINS CREEK | 0.6 | 0.6 |
| BLUME CREEK | 1.8 | 1.8 |
| BONILLA CREEK | 1.2 | 1.2 |
| BONNES CREEK | 0.9 | 0.9 |
| BOWEN CREEK | 1.1 | 1.1 |
| BULOTTI CREEK | 0.7 | 0.7 |
| BURNDALE CREEK | 1.7 | 1.7 |
| BUTLER CANYON CREEK | 2.6 | 2.6 |
| BUTLER CREEK | 0.6 | 0.6 |
| CALABAZAS CREEK | 4.6 | 5.5 |
| CANON CREEK | 0.6 | 0.6 |
| CARRIGER CREEK | 8.3 | 8.3 |
| CASTLE CREEK | 1.4 | 1.4 |
| CAVEDALE CREEK | 0.8 | 0.8 |
| CHAMPLIN CREEK | 2.8 | 2.8 |
| CHENNY CREEK | 0.1 | 0.1 |
| CLAYTON CREEK | 0.9 | 0.9 |
| COAL MINE CREEK | 1.4 | 1.4 |
| CONEY CREEK | 0.5 | 0.5 |
| CONN CREEK | 0.6 | 0.6 |
| CRILLY CREEK | 0.5 | 0.5 |
| DECKER CREEK | 0.3 | 0.3 |
| DILL CREEK | 0.3 | 0.3 |
| DINKLE CREEK | 0.7 | 0.7 |
| DOWDALL CREEK | 4.0 | 4.1 |
| DUGGANS CREEK | 1.3 | 1.3 |

Table 1: Natural channel reaches within Zones 2A and 3A potentially subject to maintenance activities.

| Name | Project Reach (mi)¹ | Stream Total Length (mi) |
|-----------------------|---------------------------------------|---------------------------------|
| DUNBAR CREEK | 1.1 | 1.1 |
| DUROC CREEK | 0.5 | 0.5 |
| EAST FORK FRYER CREEK | 1.5 | 1.8 |
| ELLIS CREEK | 1.5 | 1.5 |
| EMERSON CREEK | 0.9 | 0.9 |
| ENGLER CREEK | 2.2 | 2.3 |
| ENTERPRISE CREEK | 1.3 | 1.3 |
| FELDER CREEK | 3.6 | 3.6 |
| FISHER CREEK | 2.9 | 3.2 |
| FLASH CREEK | 2.2 | 2.2 |
| FLEA CREEK | 0.6 | 0.6 |
| FLUSH CREEK | 1.3 | 1.3 |
| FOSTER CREEK | 0.5 | 0.5 |
| FOWLER CREEK | 2.8 | 4.2 |
| FOX CREEK | 2.4 | 2.4 |
| FRYER CREEK | 0.9 | 2.5 |
| GLEN CREEK | 1.0 | 1.0 |
| GOLDEN CREEK | 1.3 | 1.3 |
| GOSS CREEK | 0.3 | 0.3 |
| GRACE CREEK | 0.8 | 0.8 |
| GRAHAM CREEK | 2.9 | 2.9 |
| GREGORY CREEK | 0.4 | 0.4 |
| HANNA CREEK | 1.7 | 1.7 |
| HARASZTHY CREEK | 3.0 | 3.0 |
| HARTZELL CREEK | 1.1 | 1.1 |
| HOFF CREEK | 1.9 | 1.9 |
| HOLLRAN CREEK | 1.5 | 1.5 |
| HOLLY CREEK | 3.3 | 3.4 |
| HOOKER CREEK | 4.5 | 5.0 |
| HOOPER CREEK | 0.7 | 0.7 |
| HUNT CREEK | 0.6 | 0.6 |
| HUTCHINSON CREEK | 0.4 | 0.4 |
| HYDE CREEK | 3.9 | 3.9 |
| IDELL CREEK | 0.5 | 0.5 |
| INMAN CREEK | 1.5 | 1.5 |
| JACKSON CREEK | 0.5 | 0.5 |
| JUSTI CREEK | 0.6 | 0.6 |
| KENT CREEK | 0.7 | 0.7 |
| KENWOOD CREEK | 2.1 | 2.5 |
| KIWI CREEK | 1.0 | 1.0 |

Table 1: Natural channel reaches within Zones 2A and 3A potentially subject to maintenance activities.

| Name | Project Reach (mi)¹ | Stream Total Length (mi) |
|--------------------|---------------------------------------|---------------------------------|
| KOHLER CREEK | 1.5 | 1.5 |
| LAFFERTY CREEK | 0.4 | 0.4 |
| LAVIN CREEK | 1.0 | 1.0 |
| LAWNDALE CREEK | 4.9 | 5.7 |
| LEWIS CREEK | 1.4 | 1.4 |
| LILLEY CREEK | 1.4 | 1.7 |
| LIZARD CREEK | 1.0 | 1.0 |
| LOS GUILICOS CREEK | 1.1 | 1.1 |
| LOVALL CREEK | 2.1 | 2.1 |
| MADRONE CREEK | 2.3 | 2.3 |
| MALLARD CREEK | 0.6 | 0.6 |
| MALONE CREEK | 3.6 | 3.6 |
| MARKINS CREEK | 0.1 | 0.1 |
| MILL CREEK | 2.8 | 2.8 |
| MONAHAN CREEK | 1.2 | 1.2 |
| MOONSHINE CREEK | 0.8 | 0.8 |
| MOUNT HOOD CREEK | 3.7 | 4.0 |
| NATHANSON CREEK | 4.8 | 7.7 |
| NELLIGAN CREEK | 4.0 | 4.0 |
| NILSON CREEK | 0.5 | 0.5 |
| NORRBOAH CREEK | 2.4 | 2.4 |
| NUNS CREEK | 0.2 | 0.2 |
| OAK WOOD CREEK | 0.7 | 0.7 |
| OAKMONT CREEK | 0.8 | 0.8 |
| O'BRIEN CREEK | 2.2 | 2.5 |
| PADRE CREEK | 0.8 | 0.8 |
| PATTEN CREEK | 1.0 | 1.0 |
| PEQUENO CREEK | 2.7 | 2.7 |
| PICKELL CREEK | 0.3 | 0.3 |
| PIKE CREEK | 0.7 | 0.7 |
| PISGAH CREEK | 1.5 | 1.5 |
| PLANK CREEK | 1.0 | 1.0 |
| POULTER CREEK | 0.9 | 0.9 |
| PRESSLEY CREEK | 0.7 | 0.7 |
| PUPPYDOGTAIL CREEK | 0.9 | 0.9 |
| RED CREEK | 1.2 | 1.2 |
| RITCHEY CREEK | 0.8 | 0.8 |
| RIXFORD CREEK | 1.1 | 1.1 |
| RODGERS CREEK | 7.9 | 9.0 |
| ROLAND CREEK | 1.0 | 1.0 |

Table 1: Natural channel reaches within Zones 2A and 3A potentially subject to maintenance activities.

| Name | Project Reach (mi)¹ | Stream Total Length (mi) |
|----------------------|---------------------------------------|---------------------------------|
| SCHELL CREEK | 1.7 | 3.5 |
| SCHOKEN CREEK | 1.2 | 1.2 |
| SIMMS CREEK | 0.7 | 0.7 |
| SLATTERLY CREEK | 0.2 | 0.2 |
| SOBRE VISTA CREEK | 2.9 | 2.9 |
| SONOMA CREEK | 26.3 | 35.2 |
| SPENCER CREEK | 0.5 | 0.5 |
| SPUR CREEK | 0.1 | 0.1 |
| STUART CREEK | 4.3 | 4.3 |
| SUGAR LOAF CREEK | 0.8 | 0.8 |
| TAYLOR CREEK | 0.7 | 0.7 |
| TRINITY CREEK | 2.1 | 2.1 |
| VANITY CREEK | 0.4 | 0.4 |
| VERANO CREEK | 0.2 | 0.8 |
| VINEBURG CREEK | 0.7 | 0.7 |
| WALDRUE CREEK | 1.2 | 1.2 |
| WARD CREEK | 0.4 | 0.4 |
| WARFIELD CREEK | 1.7 | 1.7 |
| WARSAW CREEK | 0.5 | 0.5 |
| WATMAUGH CREEK | 1.3 | 1.3 |
| WATTS CREEK | 1.2 | 1.2 |
| WEBER CREEK | 0.8 | 0.8 |
| WHITMAN CANYON CREEK | 2.7 | 2.7 |
| WILSON CREEK | 1.5 | 1.5 |
| WING CREEK | 0.7 | 0.7 |
| WINKLE CREEK | 0.9 | 0.9 |
| WOOSTER CREEK | 0.5 | 0.5 |
| YULUPA CREEK | 2.7 | 2.7 |
| Zone 2A Total | 168.9 | 187.4 |
| Zone 3A Total | 262.2 | 285.6 |
| Project Total | 431.1 | 473.0 |

¹Creek reaches not included in the Proposed Project are part of the Water Agency's SMP.

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
|--|---|---|
| Air Quality Protection | | |
| AQ-1 | Dust Management (based on Bay Area Air Quality Management District's basic dust control measures) | <ol style="list-style-type: none"> 1. Water all active maintenance areas as necessary to reduce dust emissions. In dry areas, this may be twice daily or more, while in already wet areas, no watering may be needed. 2. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain freeboard as necessary to prevent transported material from blowing from the trucks. 3. Sweep as necessary (with water sweepers or dry sweepers, as appropriate) all paved access roads, parking areas and staging areas at construction sites. 4. Sweep streets as necessary (with water sweepers or dry sweepers, as appropriate) if visible soil material is carried onto adjacent public streets. |
| Biological Resources Protection | | |
| General Measures | | |
| BR-1 | Area of Disturbance | <ol style="list-style-type: none"> 1. Activities will avoid damage to or loss of native vegetation to the maximum extent feasible. 2. Soil disturbance shall not exceed the minimum area necessary to complete the operations as described. |
| BR-2 | Pre-Maintenance Educational Training | <ol style="list-style-type: none"> 1. At the beginning of each maintenance season and before conducting stream maintenance activities, all personnel will participate in an educational training session conducted by a qualified biologist.¹ This training will include instruction on how to identify bird nests, recognize special-status species that may occur in the work areas, and the appropriate protocol if any nests or listed species are found during project implementation. 2. Personnel who miss the first training session or are hired later in the season must participate in a make-up session before conducting maintenance activities. |
| BR-3 | Biotechnical Bank Stabilization | If hydraulic conditions allow, the natural bank will be retained or a biotechnical repair technique will be used. No rock riprap will be used. |
| BR-4 | Threatened and Endangered Fish and Wildlife | <ol style="list-style-type: none"> 1. For each proposed maintenance activity, a literature review and habitat evaluation will be completed by a qualified biologist. Special status animals include, but are not limited to, California freshwater shrimp, coho salmon, Chinook salmon, steelhead, and California red-legged frog. 2. If a maintenance activity is within designated Critical Habitat for a listed species, a qualified biologist will evaluate the suitability of the habitat for the species. <u>Maintenance activities will not be</u> |

¹ A qualified biologist (including those specializing in botany, wildlife, and fisheries) is determined by a combination of academic training and professional experience in biological sciences and related resource management activities. The Water Agency may also utilize appropriately experienced and/or trained environmental staff. Resumes will be submitted to CDFW, USFWS and/or NFMS for approval prior to commencement of biological surveys.

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
|---------------|--|---|
| | | <p><u>implemented under the Proposed Project if the activity would impact the primary constituent habitat elements for a listed species.</u></p> <ol style="list-style-type: none"> 3. For projects located in areas where threatened and endangered fish and wildlife species have been identified as potentially occurring, a qualified biologist will conduct focused surveys of the project site for these species using regulatory-approved survey guidelines. 4. <u>If threatened and endangered animals are found and would be impacted, the maintenance activity will not be implemented under the Proposed Project.</u> 5. Special-status animal species near the project site will be protected from temporary disturbance by installing environmentally sensitive area fencing (orange construction barrier fencing) around sensitive habitat. Protective fencing will be installed under the direction of the biologist as necessary to protect animals and habitat; where feasible, the environmentally sensitive area fencing will be installed at least 50 ft. from the edge of the sensitive habitat. |
| BR-5 | Fish and Wildlife Relocation for Non-Threatened and Endangered Species | <ol style="list-style-type: none"> 1. A pre-construction survey for common fish and wildlife will be conducted within 24 hours of maintenance activities. Although maintenance activities will occur in dry areas, common fish, amphibian, and reptile species found within the construction area will be located to suitable habitat. 2. If needed, native fish, tadpoles, and other vertebrates will be excluded from the work area by blocking the stream around the work area with fine-meshed net or screens. The bottom of the screens will be completely secured to the channel bed. Screens will be checked periodically and cleaned of debris to permit free flow of water. 3. If avoidance is not feasible, the most efficient means for capturing fish will be determined and implemented. Complex stream habitat generally requires the use of electrofishing equipment, whereas in deep pools, fish may be captured by seining or dipnetting. Ample time will be scheduled to allow for a reasonable fish removal effort to be conducted. 4. All captured fish will be allowed to recover from electrofishing before being returned to the stream. 5. Prior to capturing fish and/or amphibians, the most appropriate release location(s) will be identified and used. The following issues will be considered when selecting release site(s): <ul style="list-style-type: none"> ▪ proximity to the work area; ▪ similar water temperature as capture location; ▪ ample habitat availability prior to release of captured fish; and ▪ low likelihood of animals reentering work site. |
| BR-6 | On-Call Wildlife Biologist | <p>A qualified biologist will be on-call in southern Sonoma County and available to visit a project site at any point during maintenance activities in the event a special status species is encountered.</p> |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| BR-7 | Special Status Plants | <ol style="list-style-type: none"> 1. For projects located in areas where special status plant species have been identified as potentially occurring based on literature and CNDDDB database searches, a qualified botanist will conduct appropriately timed focused botanical surveys of the project site for these species. 2. If a maintenance activity is within designated Critical Habitat for a listed plant species, a qualified biologist will evaluate the suitability of the habitat for the species. <u>Maintenance activities will not be implemented under the Proposed Project if the activity would impact the primary constituent habitat elements for a listed species.</u> 3. <u>If special status plants are discovered, the maintenance activity will not be implemented under the Proposed Project if a special status plant would be impacted.</u> 4. Special-status plant species near the project site will be protected from temporary disturbance by installing environmentally sensitive area fencing (orange construction barrier fencing) around special-status plant species populations. Protective fencing will be installed under the direction of the botanist as necessary to protect the plant and its habitat; where feasible, the environmentally sensitive area fencing will be installed at least 50 ft. from the edge of the population. Where special-status plant populations are located in wetlands, silt fencing will also be installed. 5. Vegetation management activities in sensitive plant areas will be conducted under the guidance of the botanist. These activities should be timed following the blooming periods of potentially occurring listed species, after the month of June. |
| BR-8 | Nesting Migratory Bird and Raptor Pre-maintenance Surveys | <ol style="list-style-type: none"> 1. To the extent feasible, maintenance activities, including tree trimming, will take place outside the migratory bird and raptor nesting period (February 15 through August 15 for most birds). During the nesting bird season, work sites that are less densely vegetated will be prioritized, to facilitate pre-maintenance surveys and decrease the likelihood of disturbing undiscovered nests. 2. If maintenance activities must be scheduled to occur during the nesting season, a qualified wildlife biologist, familiar with the species and habitats in the area, will conduct pre-maintenance surveys for raptors and nesting birds within suitable habitat. The surveys should be conducted within one week before initiation of maintenance activities within those habitats. If no active nests are detected during surveys, activities may proceed. Vegetation removal activities will be conducted under the guidance of a biologist. If active nests are detected then measure 3, below, would be implemented. 3. If active nests are identified in the work area, non-disturbance buffers shall be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover and species' tolerance to disturbance. Buffer size shall be determined in cooperation with the CDFW. If active nests are found within 300 feet of the work area, a qualified biologist shall be on site as necessary to monitor the nests for signs of nest disturbance. If it is determined |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| | | that maintenance activity is resulting in nest disturbance, work shall cease immediately and CDFW shall be contacted. Buffers will be developed through consultation with CDFW. Buffers will remain in place until biologists determine that the young have successfully fledged or nests have been otherwise abandoned. |
| Cultural Resources Protection | | |
| CR-1 | Cultural Resources Investigation | <p>For maintenance activities which require excavation into native soils (e.g., bank stabilization, etc.), a cultural resources investigation shall be conducted by a qualified professional archeologist prior to performing the maintenance activity. The cultural resources investigation shall include the following elements:</p> <ol style="list-style-type: none"> <li data-bbox="570 743 1406 890">1. The Water Agency will comply with tribal cultural resource as defined in Public Resources Code 21074, including consulting with California Native American tribe(s) that are traditionally and culturally affiliated with the geographic area of a proposed maintenance project. <li data-bbox="570 905 1414 1262">2. <i>Background Research and Native American Consultation.</i> An updated records search shall be conducted at locations planned for maintenance that have not had a records search completed within the previous five years. Investigations should begin with a review of the data acquired for this document to determine whether the proposed activity will occur within a previously-known culturally-sensitive area. An addendum records search at the Northwest Information Center (NWIC) will also be necessary to determine if any cultural resources have been recorded since the creation of this document. The records search will identify resources within or near the project location and determine whether that location has been previously surveyed up to current standards. In conjunction with the background research, the appropriate Native American Tribes will be contacted to provide comments or concerns about a maintenance activity location. The Native American Heritage Commission (NAHC) will also be contacted for a Sacred Lands File Check. <li data-bbox="570 1440 1414 1833">3. <i>Pedestrian Survey.</i> If an adequate survey has not been completed for a project location within a ten-year period from the date of scheduled maintenance, a pedestrian survey is required. All areas of exposed ground should be closely inspected for the presence of cultural materials. Areas of dense vegetation should be inspected as closely as possible and any exposed channel banks should be carefully examined for the presence of buried cultural resources. If an archaeological deposit is encountered, a preliminary assessment of site boundaries should be made in consultation with the appropriate affiliated tribe(s). A map should be prepared depicting site boundaries in relation to the work area, and the site should be recorded on a standard archaeological site record (DPR 523 form). |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| | | <p><u>If a significant cultural resource cannot be avoided the maintenance activity will not be implemented under the Proposed Project.</u></p> <p>4. <i>Documentation.</i> If findings are negative, these results will be presented in the annual notification package. If findings are positive, a positive Archaeological Survey Report (ASR)/Historic Property Survey Report (HPSR) will be prepared that includes appropriate background research, site records, and recommendations for additional work. Prior to finalization of such document, a copy will be provided to the appropriate affiliated tribe(s) for review and comment. The report will include results of background research, descriptions of field work, findings, appropriate maps and photos, and a record of Native American consultation. A cover letter will detail management recommendations, which could include archaeological and Native American monitoring, site avoidance, or test excavations to determine site significance. The report will be submitted to the Water Agency and the NWIC. All information regarding the site locations, Native American human remains, and associated funerary objects will be kept confidential and will not be made available for public disclosure. The final written report will be submitted within 3 months after work has been completed to the NWIC.</p> |
| CR-2 | Previously Undiscovered Cultural Resources | <p><i>Inadvertent Discoveries:</i> If discovery is made of items of historical or archaeological interest, activity will immediately cease in the project location (within approximately 50-feet) of discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or tool making debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, hand stones, or milling slabs); and battered stone tools, such as hammer stones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation the contractor shall immediately contact the Water Agency. Maintenance will not resume until authorization is received from the Water Agency.</p> <ul style="list-style-type: none"> ▪ In the event of unanticipated discovery of archaeological indicators during construction, the Water Agency will retain the services of a qualified professional archaeologist to evaluate, in consultation with the appropriate affiliated tribe(s), the significance of the items prior to resuming any activities that could impact the site. ▪ In the case of an unanticipated archaeological discovery that is determined to be potentially eligible for listing in the National and/or California Register, and the site cannot be avoided, <u>the Water Agency will not implement the maintenance work under the Proposed Project.</u> <p><i>Discovery of Human Remains:</i> If potential human remains are encountered, the Water Agency shall halt work in the vicinity of the find and contact the county coroner in accordance with Public Resources</p> |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| | | Code Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner will contact the NAHC. As provided in Public Resources Code Section 5097.98, the NAHC will identify the person or persons believed to be most likely descended from the deceased Native American. The Most Likely Descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98. |
| CR-3 | Previously Undiscovered Paleontological Resources | If fossil remains are encountered during maintenance, the maintenance activity will be stopped until a qualified professional paleontologist can assess the nature and importance of the find and recommend appropriate treatment. The Water Agency shall retain a consultant who meets the Society for Vertebrate Paleontology's criteria for a "qualified professional paleontologist" (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995). Treatment may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation of a report for publication describing the finds. The Water Agency shall be responsible for ensuring that the recommendations of the paleontologist regarding treatment and reporting are implemented. |
| General Impact Avoidance and Minimization | | |
| GEN-1 | Work Window | <ol style="list-style-type: none"> 1. All ground-disturbing maintenance activities occurring in the channel (i.e., from top-of-bank to top-of-bank) will take place during the low-flow period, between June 15 and October 31. Exceptions include the removal of trash debris or on a project-by-project basis with advance approval of RWQCB, CDFW, NMFS, and/or USFWS as appropriate. 2. Prior to the first significant rainfall, exposed soils in will be stabilized via hydroseeding or with erosion control fabric/blankets. Significant rainfall is defined as a forecast of 50% or greater chance of precipitation. 3. Work on the upper banks of stream channels (e.g., vegetation) may be conducted year round. Ground disturbing activities will only be conducted during periods of dry weather. |
| GEN-2 | Staging and Stockpiling of Materials | <ol style="list-style-type: none"> 1. Staging will occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation to the extent feasible. Similarly, to the extent practical, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. Staging areas for equipment, personnel, vehicle parking, and material storage shall be sited as far as possible from major roadways. 2. All maintenance-related items including equipment, stockpiled material, temporary erosion control treatments, and trash, will be removed within 72 hours of project completion. All residual soils and/or materials will be cleared from the project site. |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| | | <ol style="list-style-type: none"> 3. As necessary, to prevent sediment-laden water from being released back into the channel during transport of spoils to disposal locations, truck beds will be lined with an impervious material (e.g., plastic), or the tailgate blocked with wattles, hay bales, or other appropriate filtration material. If appropriate, and only within the active work area where the sediment is being loaded into the trucks, trucks may drain excess water by slightly tilting the loads and allowing the water to drain out through the applied filter. 4. Building materials and other maintenance-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains or where they will cover aquatic or riparian vegetation. 5. No runoff from the staging areas may be allowed to enter waters of the State, including the creek channel or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, hay wattles or bales, silt screens). The discharge of decant water from any on-site temporary sediment stockpile or storage areas, to waters of the State, including surface waters or surface water drainage courses, outside of the active project site, is prohibited. 6. During dry season, no stockpiled soils shall remain exposed and unworked for more than 30 days. During wet season, no stockpiled soils shall remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control. 7. All spoils will be disposed of in an approved location. |
| GEN-3 | Channel Access | <ol style="list-style-type: none"> 1. Access points to the channel for the purposes of stream maintenance will be minimized and only include foot traffic. No heavy equipment shall enter a creek channel. 2. In considering channel access routes, slopes of greater than 20 percent shall be avoided if possible. |
| Good Neighbor Policies | | |
| GN-1 | Work Site Housekeeping | <ol style="list-style-type: none"> 1. The Water Agency will maintain the work site in a neat and orderly condition, and will leave the site in a neat, clean, and orderly condition when work is complete. To the extent feasible, slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. Paved access roads will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity. 2. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged. |
| GN-2 | Noise Control | <ol style="list-style-type: none"> 1. With the exception of emergencies, normal work will be limited to normal business hours (8:00 a.m.–5:00 p.m.). Routine activities in residential areas will not occur on Saturdays, Sundays, or the Water Agency observed state holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents. 2. The Water Agency will ensure that power equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) is |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| GN-4 | Traffic Flow, Pedestrians, and Safety Measures | <p>equipped with original manufacturer’s sound-control devices, or alternate sound control that is no less effective than those provided as original equipment. Equipment will be operated and maintained to meet applicable standards for construction noise generation. No equipment will be operated with an unmuffled exhaust.</p> <ol style="list-style-type: none"> 1. To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be coordinated with the appropriate jurisdictional agency and scheduled to occur outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. Any lane closures will include advance warning signage, a detour route and flaggers will be provided in both directions. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded. 2. Public transit access and routes shall be maintained to the extent feasible. If public transit would be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities. 3. Heavy equipment and haul traffic will be prohibited in residential areas, except when no other route to and from the site is available. 4. Roadway segments or intersections in the vicinity of project sites will be assessed to determine if they are at, or approaching a Level of Service (LOS) that exceeds local standards. Maintenance traffic will avoid these locations to the extent feasible, either by traveling different routes or by traveling at non-peak times of day. 5. Adequate off-street parking will be provided or designated public parking areas will be used for maintenance workers’ personal vehicles and maintenance-related vehicles not in use through the maintenance period. 6. Access for driveways and private roads will be maintained to the extent feasible. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities. |
| Hazardous Materials Safety | | |
| HAZ-1 | Spill Prevention and Response Plan | <p>The Water Agency will develop a Spill Prevention and Response Plan prior to commencement of maintenance activities. The plan will summarize the measures required under BMPs HAZ-2 through HAZ-6. It will also require that:</p> <ol style="list-style-type: none"> 1. Equipment and materials for cleanup of spills be available on site and that spills and leaks will be cleaned up immediately and disposed of properly; |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
|--------|------|--|
| | | <p>2. Prior to entering the work site, all field personnel shall be appropriately trained in spill prevention, hazardous material control, and clean-up of accidental spills.</p> <p>3. Field personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means.</p> <p>4. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). All field personnel shall be advised of these locations and trained in their appropriate use.</p> <p>The Water Agency will routinely inspect the work site to verify that the Spill Prevention and Response Plan is properly implemented and maintained. The Water Agency will notify contractors immediately if there is a noncompliance issue and will require compliance.</p> <p>Absorbent materials will be used on small spills located on impervious surface rather than hosing down the spill; wash waters shall not discharge to the storm drainage system or surface waters. For small spills on pervious surfaces such as soils, wet materials will be excavated and properly disposed rather than burying it. The absorbent materials will be collected and disposed of properly and promptly.</p> <p>As defined in 40 CFR 110, a federal reportable spill of petroleum products is the spilled quantity that:</p> <ul style="list-style-type: none"> ▪ violates applicable water quality standards; ▪ causes a film or sheen on, or discoloration of, the water surface or adjoining shoreline; or ▪ causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. <p>If a spill is reportable, the contractor’s superintendent will notify the Agency, and the Water Agency will take action to contact the appropriate safety and cleanup crews to ensure that the Spill Prevention and Response Plan is followed. A written description of reportable releases must be submitted to the appropriate RWQCB and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.</p> <p>If an appreciable spill has occurred, and results determine that project activities have adversely affected surface water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Agency or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the Water Agency, DTSC, and the RWQCB.</p> |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| HAZ-2 | Equipment and Vehicle Maintenance | <ol style="list-style-type: none"> 1. All vehicles and equipment will be kept clean. Excessive build-up of oil or grease will be avoided. 2. Vehicle and equipment maintenance activities will be conducted off-site or in a designated, protected area away from the channel where vehicle fluids and spills can be handled with reduced risk to water quality. 3. If maintenance must occur on-site, designated areas will not directly connect to the ground, surface waters, or the storm drainage system to prevent the run-on of stormwater and runoff of spills. The service area will be clearly designated with berms, sandbags, or other barriers. 4. Secondary containment, such as a drain pan or drop cloth, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of off-site. 5. Cracked batteries will be stored in a non-leaking secondary container and removed from the site. 6. Spill clean-up materials will be stockpiled where they are readily accessible. 7. Incoming vehicles and equipment will be checked for leaking oil and fluids (including delivery trucks, and employee and subcontractor vehicles). Leaking vehicles or equipment will not be allowed on-site. |
| HAZ-3 | Equipment and Vehicle Cleaning | <ol style="list-style-type: none"> 1. Equipment will be cleaned of any sediment or vegetation before transferring and using in a different watershed to avoid spreading pathogens or exotic/invasive species between watersheds. 2. Vehicle and equipment washing will occur on-site as needed to prevent spread of pathogens or exotic/invasive species. No runoff from vehicle or equipment washing will be allowed to enter waters of the State, including the creek channel or storm drains, without being subjected to adequate filtration (e.g., vegetated buffers, hay wattles, or bales, silt screens). The discharge of decant water from any on-site wash areas to waters of the State or to areas outside of the active project site is prohibited. Additional vehicle and equipment washing will occur on an appropriate wash rack at the Water Agency's maintenance center. |
| HAZ-4 | Refueling | <ol style="list-style-type: none"> 1. All off-site fueling sites (e.g., on access roads above the top-of-bank) shall be equipped with secondary containment and avoid a direct connection to underlying soil, surface water, or the storm drainage system. 2. For stationary equipment that must be fueled on-site, secondary containment, such as a drain pan or drop cloth, shall be provided in such a manner to prevent accidental spill of fuels to underlying soil, surface water, or the storm drainage system. |
| HAZ-5 | On-Site Hazardous | <ol style="list-style-type: none"> 1. The products used and/or expected to be used and the end products that are produced and/or expected to be produced after their use will be inventoried. |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
|---------------|-----------------------------------|--|
| | Materials Management | <ol style="list-style-type: none"> 2. As appropriate, containers will be properly labeled with a “Hazardous Waste” label and hazardous waste will be properly recycled or disposed of off-site. 3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage. 4. Quantities of equipment fuels and lubricants greater than 55 gallons shall be provided with secondary containment that is capable of containing 110% of the primary container(s). 5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials shall not be allowed to enter receiving waters or the storm drainage system. 6. Sanitation facilities (e.g., portable toilets) will be surrounded by a berm, and a direct connection to the storm drainage system or receiving water will be avoided. 7. Sanitation facilities will be regularly cleaned and/or replaced, and inspected regularly for leaks and spills. 8. Waste disposal containers will be covered when they are not in use, and a direct connection to the storm drainage system or receiving water will be avoided. 9. All trash that is brought to a project site during maintenance activities (e.g., plastic water bottles, plastic lunch bags) will be removed from the site daily. |
| HAZ-6 | Existing Hazardous Sites or Waste | <p>Upon selection of maintenance project locations, the Water Agency will conduct a search for existing known contaminated sites on the State Water Resource Control Board’s GeoTracker website (http://www.geotracker.waterboards.ca.gov). For any proposed maintenance sites located within 1,500 feet of any “open” sites where contamination has not been remediated, the Water Agency will contact the RWQCB case manager listed in the database. The Water Agency will work with the case manager to ensure maintenance activities would not affect cleanup or monitoring activities or threaten the public or environment.</p> <p>If hazardous materials, such as oil or paint cans, are encountered at the maintenance sites, the Water Agency will carefully remove and dispose of them according to the Spill Prevention and Response plan. Water Agency staff will wear proper protective gear and store the waste in an appropriate hazardous waste container until it can be disposed at a hazardous waste facility.</p> |
| HAZ-7 | Fire Prevention | <ol style="list-style-type: none"> 1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. On days when the fire danger is high and a burn permit is required (as issued by the relevant Air Pollution Control District), flammable |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| | | <p>materials, including flammable vegetation slash, will be kept at least 10 feet away from any equipment that could produce a spark, fire, or flame.</p> <p>4. On days when the fire danger is high and a burn permit is required, portable tools powered by gasoline-fueled internal combustion engines will not be used within 25 feet of any flammable materials unless at least one round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).</p> |
| Vegetation Management | | |
| VEG-1 | Removal of Existing Vegetation | <ol style="list-style-type: none"> 1. Vegetation pruning and removal activities will be conducted under the guidance of a staff biologist or certified arborist. 2. Only vegetation that is noxious, invasive, hazardous, or could obstruct channel flows will be removed. Herbaceous layers that provide erosion protection and habitat value will be left in place. Invasive plant species that inhibit the health and/or growth of native riparian trees will be targeted for removal. 3. Where a choice between species that may be removed to maintain flood conveyance is feasible, slower-growing species such as oaks (<i>Quercus</i> spp.) that develop large canopies will be preferentially preserved, because these species take longer to establish, and provide essential nesting habitat for cavity nesters and food sources for a variety of resident and migratory animals and birds. Faster-growing species such as alders (<i>Alnus</i> spp.) and cottonwoods (<i>Populus</i> spp.) are the second priority for preservation; these single-trunked species offer the benefit of improved flood conveyance and reduced roughness by comparison with multi-trunked species. 4. Vegetation will be removed and/or pruned in such a manner that channel roughness is reduced while allowing the maximum amount of vegetation to remain in place. Trees will be trimmed or pruned to reduce impedance of flood flows while allowing the canopy to develop. Specifics for each site will differ, but typical options include limbing up to remove lower branches that have potential to interfere with flood flows, and pruning into a “fan” roughly parallel to flow direction. 5. Vegetation management will emphasize the preservation of large mature trees that provide well developed overstory for bird habitat, canopy closure for stream shading, and add vertical complexity to the riparian corridor. Vegetation management will be conducted in such a manner that maximizes shading over the active channel. Larger trees will be retained on both sides of north-south flowing streams and on the south side of east-west flowing streams. Where vegetation is removed from the active channel, removal will target nonnative species and removal of native species that are stiff and/or multi-trunked such as arroyo willow (<i>Salix lasiolepis</i>). Trees will never be topped as this encourages shrubby growth and weak branch attachments |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
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| | | <ol style="list-style-type: none"> 6. Large woody debris, stumps, or root wads that are fully or partially buried and do not present a flood hazard shall be allowed to remain in place to provide habitat and to maintain bank stability. 7. If vegetation requires removal for access to project site, non-native species and/or quick growing species shall be targeted first for removal. Removal of native, mature trees will be avoided whenever possible. 8. To the extent feasible, removed native vegetation shall be saved to replant after maintenance or plant in other nearby sites. This includes the reuse of mulch and willow sprigs where possible. |
| VEG-2 | Planting and Revegetation After Soil Disturbance | <ol style="list-style-type: none"> 1. Sites where maintenance activities result in exposed soil will be stabilized to prevent erosion and revegetated with native vegetation as soon as feasible after maintenance activities are complete. 2. Revegetation will occur at a ratio of at least 1½: 1 to account for initial mortality of plantings. 3. To the extent possible, native grass seed will be used when seeding a project site. 4. Erosion control fabric, hydromulch, or other mechanism will be applied as appropriate to provide protection to seeds, hold them in place, and help retain moisture. |
| Water Quality and Channel Protection | | |
| WQ-1 | Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils | <ol style="list-style-type: none"> 1. Upland soils exposed due to maintenance activities will be seeded and stabilized using erosion control fabric or hydroseeding. The channel bed and other areas below ordinary high water mark are exempt from this BMP. 2. Erosion control fabric will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would not be impacted by the application. 3. The site will be properly prepared to make sure the fabric/mat has complete contact with the soil. Sites can be prepared by grading and shaping the installation area; removing all rocks, dirt clods, vegetation, etc.; preparing the seedbed by loosening the top 2- to 3-inches of soil; and applying soil amendments as directed by soil tests, the seeding plan, and manufacturer's recommendations. 4. The area will be seeded before installing the fabric. All areas disturbed during installation will be re-seeded. 5. Erosion control fabric will be anchored in place. Anchors can include U-shaped wire staples, metal geotextiles stake pins or triangular wooden stakes. 6. The manufacturer's installation recommendations will be followed. |

Table 2. Best Management Practices for Natural Channels Maintenance in Zones 2A and 3A

| BMP ID | Name | BMP |
|--------|------|--|
| | | 7. Other erosion control measures shall be implemented as necessary to ensure that sediment or other contaminants do not reach surface water bodies for stockpiled or reused/disposed sediments. |

requests from the public, the Proposed Project includes an upper limit of 100 cubic yards of material removed along up to 3,000 feet of stream bank per five-year maintenance period. There would be no limit on the number of trash debris removal events. Projects in excess of these limits may be proposed separately to regulatory entities for review. The two categories of maintenance activities are described below.

2.1 Vegetation Management

The Water Agency would conduct vegetation management activities to maintain flow conveyance and capacity, establish a canopy of riparian trees by selectively retaining native tree species, trimming lower branches, and controlling invasive vegetation, such as giant reed (*Arundo donax*) and Himalayan blackberry (*Rubus armerniacus*). Please see the Vegetation Management section in Table 2 for a list of the Proposed Project’s BMPs. Vegetation activities consist of trimming, pruning, mowing, and removal of flow-constricting vegetation within a creek reach. Mature native trees would not be removed, but may be pruned to prevent bank damage from an unstable tree or a branch that may cause flood damage. Also, trash and vegetative materials that may cause flood damage (mattresses, tires, appliances, etc.) would be removed. Vegetation management would be conducted primarily using hand tools, such as hand pruning and chainsaws. Heavy equipment may be needed to remove large debris. Depending on the specific project needs, vegetation management may also consist of habitat enhancement activities including planting of native trees, shrubs, and in-stream grasses and sedges.

The Water Agency manages trees and large branches that naturally fall into stream channels to maintain channel hydrologic capacity. The Water Agency seeks to promote recruitment of woody debris in channels to benefit in-stream habitat for fisheries and wildlife. The preference is to leave downed trees in place and encourage formation of channel features such as scour pools and slack water areas, which are used by aquatic animals and increase stream channel complexity. However, if the tree threatens flood conveyance capacity or channel stability (e.g., destabilizes a stream bank or damages a road culvert/bridge) the downed tree may be modified by trimming off branches or cutting it into smaller pieces. If further action is needed, the tree may be repositioned in the channel, such as moved from perpendicular to parallel to stream flow, or removed entirely.

Vegetation Management Triggers

In general, vegetation management is appropriate when any of the following conditions occur:

- Vegetation growth is significantly decreasing flood conveyance capacity, particularly where infrastructure or adjacent properties are at risk;
- Vegetation growth is significant and obstructs access to channels and facilities or threatens neighboring property;
- Invasive nonnative plants are reducing the success of native vegetation; or
- Vegetation management offers good opportunities to improve habitat value for fish and wildlife.

The decision to prune or trim individual trees will be made in the field by Water Agency field staff familiar with regional and wetland ecology. Removal of healthy stable trees is not proposed. Consideration for individual tree trimming will be based on several factors including:

- What is the degree of blockage across the creek and where is the tree located in the channel?
- What is the minimum an individual tree can be pruned to provide the necessary conveyance capacity?
- Does the tree under consideration provide shade or other habitat benefits?
- Does the tree under question provide longer-term canopy development or riparian corridor benefits?

The rationale to prune or trim trees will be based on addressing these questions above. Answering these questions requires the oversight and guidance of a biologist or arborist that is familiar with the Project Area's vegetation and knowledgeable of channel botanical conditions.

2.2 Erosion Protection

When possible, bank stabilization would be facilitated by preventative activities such as planting exposed banks with appropriate native species that would enhance riparian and aquatic habitats. Erosion protection will follow the Proposed Project's BMPs to minimize upland and bank erosion and poor water quality (Table 2, Water Quality and Channel Protection section). Biotechnical erosion controls may be used, if needed. This could include biodegradable erosion control fabric with coir logs, brush mattresses, willow (*Salix* sp.) or dogwood (*Cornus* sp.) stakes, and willow walls. Rock riprap and other hardscape elements would not be used. Most biotechnical work would be conducted using hand tools. These biotechnical measures are expected to be small in

scale and require limited excavation or grading. Minor bank grading with mechanical equipment may be used when installing willow walls, mattresses, or other biotechnical remediation. Trucks and other heavy equipment may be used at the top of bank; however, no in-stream work with heavy equipment would be permitted. A typical erosion protection action may consist of installing a willow wall along 100 feet of unstable bank requiring 3 cubic yards of grading and trenching, seeding or planting with native wetland and transitional species, and covering barren areas with coconut fiber fabric.

Erosion Protection Triggers

In general, bank stabilization is likely to be needed in reaches where one or more of the following conditions apply:

- Bank failure has occurred, or is likely to occur, and the bank must be repaired to re-establish the bank of a creek, preserve riparian vegetation, prevent additional sediment input to the channel, and/or protect the creek's flood conveyance capacity.
- Chronic bank erosion is occurring, leading to excess sediment loading and/or damage to riparian vegetation.
- Bank erosion or failure poses a threat to existing infrastructure or adjacent land uses.

2.3 Project Benefits and Temporary Disturbance

Overall, the proposed maintenance activities will likely benefit fish, wildlife and their aquatic and riparian habitats by restoring in-stream function and riparian habitat. Vegetation management will focus on the removal of nonnative invasive plants (e.g., Himalayan blackberry) that will be replaced with native riparian species. Most downed trees would be kept as habitat. If a downed tree must be removed, riparian sapling trees would be planted onsite. Debris removal would likely benefit fish and wildlife by reducing a potential barrier to fish passage or possible source of water contamination. The proposed small-scale bank stabilization activities would improve water quality, reduce sedimentation, and include native plantings. The temporary and superficial disturbance that may occur during project activities would be compensated by bank erosion measures and plantings to re-establish riparian vegetation.

2.4 Habitat and Species Protection

The Proposed Project's BMPs (Table 2) were developed to protect the natural resources of Zone 2A and 3A. These measures are standard operating procedures currently implemented in the SMP and would be implemented for all activities conducted under the Proposed Project.

Waterways in Zones 2A and 3A are known to provide habitat for a variety of plants, fish, and wildlife, including species protected under federal and state regulations. Aquatic species such as Central California Coast steelhead (*Oncorhynchus mykiss*), Central

California Coast coho salmon (*Oncorhynchus kisutch*), California Coastal Chinook salmon (*Oncorhynchus tshawytscha*), California freshwater shrimp (*Syncaris pacifica*), and California red-legged frog (*Rana draytonii*) are state and/or federally listed species that are known to occur in Zones 2A and 3A. Foothill yellow-legged frog (*Rana boylei*) and western pond turtle (*Actinemys marmorata*) are state species of concern that occur in Zones 2A and 3A. However, measures will be taken to avoid or minimize these species and their habitat (Table 2, see Biological Resources section), which may include excluding a maintenance task from the Proposed Project.

A habitat evaluation and literature search of the potential occurrence of special status species will be completed prior to any vegetation or erosion maintenance activity (Table 2, BR-4). Literature review will consist of a search of the California Natural Diversity Database managed by CDFW, federally designated Critical Habitat, environmental reports, fish reports prepared by Rob Leidy, Water Agency archives, and interviews with local biologists. An evaluation of the habitats onsite will be conducted by a qualified biologist to characterize habitats, identify Critical Habitat features (primary constituent elements), and the potential occurrence of special status species.

This evaluation would be included in the annual notification process. If potential habitat were identified in the Project Area, focused surveys would be completed to determine the presence or absence of special status species. Standard sampling techniques would be used to detect a target species such as electrofishing for fish, multiple visual encounter surveys for reptiles and amphibians, and dipnet surveys for freshwater shrimp. The USFWS and CDFW have issued guidelines to conduct California red-legged frog surveys. If a listed species is found within a project site or if suitable habitat is found to be present, based on focused surveys, and impacts to a species or habitat cannot be avoided with BMPs the maintenance activity would not be completed. Maintenance activities that have special status species concerns would be excluded from the Proposed Project. Non-listed fish and wildlife species, including western pond turtle and foothill yellow-legged frog, found in the project site would be relocated, as needed, prior to construction to suitable habitat along the creek (Table 2, BR-5).

2.5 Timing of Work

The majority of vegetation management and erosion protection activities occurring below the top of bank along a creek would take place between June 15 and October 31. These activities include downed tree repositioning or removal and pruning and vegetation removal. Trash and debris removal would be conducted year round. Occasionally, work requests occur outside the June 15 through October 31 work period. The Water Agency will assess these situations and collaborate with the CDFW, Regional Water Quality Control Board, US Army Corps of Engineers, USFWS, and NMFS to determine if there is an acute hydraulic conveyance issue that requires

immediate action. Following these consultations work would proceed only as advised by the relevant regulatory agencies.

2.6 Development of Annual Project Work Plan

A project description will be developed for each maintenance location proposed each year. This annual work plan will include the following information:

- Project type (i.e., vegetation management, erosion protection)
- Project location address and/or location description
- Project site map
- Site specific photographs
- Sensitive species habitat evaluation and survey findings
- Short description of activities including treatments selected, equipment used, access, staging, etc.
- Short description of why the selected treatment is appropriate and needed for the reach based on the vegetation management and erosion protection triggers.
- Linear feet of creek and acres of stream that will be disturbed by activities.
- Acres of waters of the United States and waters of the State that will be affected
- Estimate of volume of material needed for excavation or backfill.

By May 1st of each year, the Water Agency will notify the regulatory agencies about the planned vegetation maintenance and erosion protection projects for that year's activities through submittal of an Annual Project Work Plan Notification. The regulatory agencies will have 45-days to review the notification and respond back to the Water Agency by June 15th to confirm the annual work plan and provide a notice to proceed or indicate needed modifications to the notification. Debris removal tasks would be conducted as needed each year and a summary of work performed included in the annual report.

Also, before June 15 of each year, the Water Agency will offer to organize a meeting and field tour with the regulatory agencies, to discuss the projects scheduled for the upcoming maintenance season.

Mid-Season Work Addendum

Since maintenance activities would occur on private property, requests for service could come to the Water Agency at any time of the year. To address mid-season maintenance requests, the Water Agency will prepare an Addendum to the Annual Project Work Plan Notification that will be submitted to regulatory agencies for approval in August. Maintenance activities, such as trash removal and minor vegetation maintenance, that are requested after August would be reported in the Annual Summary Report as described below in Section 2.8.

2.7 Work Plan Implementation

All maintenance activities will be conducted in accordance with the project descriptions provided in the annual work plans, BMPs, and terms of the resource agency permits. This includes conducting pre-construction surveys for fish and wildlife and other resources if activities may affect these resources. An on-site project supervisor will oversee and guide all maintenance activities and will ensure that specified avoidance and minimization approaches are employed. When projects are implemented, data will be collected at the project site prior to, and immediately after, project implementation.

Data collected will include before and after photos, quantification of excavated material (if any), length of stream channel maintained, quantity and location of any debris disposed off-site (if any), and any other additional relevant information. A database will be used to track the location, magnitude, frequency of work completed, cumulative work completed, program success, and help identify problem areas.

2.8 Annual Reporting

At the conclusion of each year's maintenance season a summary report would be developed and submitted to the permitting agencies by January 31. This report will include a summary of the year's maintenance projects describing the work plan status and confirming which projects from the work plan were completed. The report may include additional information on project site conditions, activities employed, monitoring, the effectiveness of certain activities, possible recommendations for future maintenance, or suggestions to improve implementation and management.

3.0 Environmental Setting

This chapter presents the environmental setting focusing on the physical and biological conditions of the Proposed Project's Flood Control Zones 2A and 3A. This information provides the foundation for developing stream characterizations and potential impacts discussed in Chapter 4.

The resource setting also provides an important basis for environmental compliance. Physical and biological resources have been considered to address the regulatory requirements of the federal Endangered Species Act (ESA), California Endangered Species Act (CESA), Clean Water Act (CWA) Sections 401 and 404, the Porter-Cologne Water Quality Control Act, and California Fish and Game Code Section 1600 et seq. The below sections characterize the conditions in the Zones 2A and 3A Project Area.

3.1 Topography and Landforms

The physiography of Zones 2A and 3A in southern Sonoma County is generally defined by a sequence of northwest to southeast aligned valleys and ridgelines that follow the regional tectonic and geologic structure. The Mayacamas Mountains separate Sonoma and Napa counties. The westward draining slopes of the Mayacamas Mountains provide headwater drainage areas to the eastern Sonoma Creek watershed area in Zone 3A. The Sonoma Mountains separate the northern Petaluma River (Zone 2A) and western Sonoma Creek watershed areas.

In the Project Area steep canyons and mountain streams carry flows and sediment to the valley floors building characteristic alluvial fans. The slopes of the Petaluma River watershed have a northeast-southwest alignment descending to the Petaluma River at the base of the watershed that flows southeasterly to the San Pablo Bay. The Sonoma Creek watershed is more elongated and symmetrical than the Petaluma basin. In the Sonoma Creek system, canyon tributaries descend from both the Mayacamas in the east and Sonoma Mountains in the west on to the valley floor where Sonoma Creek leads southward to the San Pablo Bay.

The alluvial fans noted above are found at the base of mountains in Project Area watersheds. The fans represent the accumulation of sediment over many centuries. Historically, these alluvial fans functioned as depositional areas that stored sediments in the topographic transition between the higher and steeper mountains to the east and the lower and more gently sloping plains to the west. Streams historically migrated across these alluvial fan surfaces (swinging in a snake-like fashion over time) through braided channels and distributed sediments evenly across the surface. Over time fans prograded downstream onto the lower plain surface depending upon sediment sources, climatic conditions, and tectonic activity.

3.2 Watersheds, Creeks, and Land Use

Petaluma River Watershed

The Petaluma River watershed (146 square miles) lies in Sonoma (112 sq. mi.) and Marin (34 sq. mi.) counties. Most of this watershed in Sonoma County is included in Zone 2A (Figure 1). The highest elevation in the watershed is Sonoma Mountain (2,295 ft) and the lowest elevation is sea level at San Pablo Bay.

In the northeastern Petaluma River watershed, tributaries flow southwest out of the Sonoma Mountains to the Petaluma River and then flow southeast to San Pablo Bay. The Petaluma Valley in the central watershed forms a wide basin with rolling hills and grasslands that stretches from Cotati southeast to San Pablo Bay. There are 76 streams in Zone 2A, consisting of 187.4 miles of which 168.9 miles would be included in the Proposed Project (Figure 1; Appendix A, Table A-1). Primary tributaries to the

Petaluma River include Adobe, Ellis, Lichau, Lynch, Marin, San Antonio, Washington, and Willow Brook creeks.

Predominant land uses in the Petaluma River watershed are agriculture, rural residential, and the urban center of Petaluma. The urban area of Petaluma is centrally located in the lowlands of the watershed. The surrounding foothills and upper watershed are agricultural and rural lands.

Sonoma Creek Watershed

The Sonoma Creek watershed (170 sq. mi.) is located between the Petaluma River and Napa River. Zone 3A includes the upper Sonoma Valley watershed. In the Sonoma Creek watershed, canyon tributaries descend from both the Mayacamas Mountains in the east and Sonoma Mountains in the west to the valley floor where Sonoma Creek flows southward to San Pablo Bay.

Elevations in the watershed range from about 2,500 ft at Bald Mountain to sea level at San Pablo Bay. There are 150 streams in Zone 3A consisting of 285.6 miles of which 262.2 miles would be included in the Proposed Project (Figure 2; Appendix A, Table A-1). Large tributaries in the watershed that drain to Sonoma Creek include Calabazas, Carriger, Fowler, Fryer, Hooker, Nathanson, Rodgers, and Schell creeks.

Land uses in the Sonoma Creek watershed are mixed, but contain a high percentage of both agriculture and ranchland uses. The town of Sonoma is the main urban center and is located at the lower end of Zone 3A.

3.3 Geology and Soils

Regional Tectonism and Older Rocks

The geology and structure of the Project Area in southern Sonoma County has been shaped through a dynamic history of tectonism along the San Andreas Fault Zone. The northwest-southeast alignment of this fault zone with its characteristic right-lateral strike-slip tensional movement is reflected in the alignment and orientation of the region's ridgelines and valleys (see landform discussion above). Movement along the fault zone was not only lateral, but also included compression resulting in the mountain building of the Coast Ranges in the Project Area. In geologic terms, this combination of lateral-tension plus compression is known as transpression. In Sonoma County, the main artery of the San Andreas Fault roughly follows Highway 1 near the coast. In Zones 2A and 3A the Healdsburg-Roger's Creek and Mayacama faults represent more interior arms of the San Andreas system, sharing its same orientation.

The San Andreas Fault has been relatively quiet in Sonoma County since the historic 1906 earthquake (magnitude 8.3). The Healdsburg-Rogers Creek and Mayacama faults are considered active faults with known activity during the Holocene period (last

10,000 years). Of recent note, in 1969 two moderate earthquakes (magnitudes 5.6 and 5.7) along the Rogers Creek Fault caused moderate damage in Santa Rosa. The Rodgers fault extends along Sonoma Mountain from San Pablo Bay to Santa Rosa within Zones 2A and 3A.

The distribution and sequence of rock types in the Project Area reflect the area's geologic history (Norris and Webb 1990). The oldest rocks include the Great Valley Complex with its tilted marine sedimentary layers, mostly sandstones and shales, which underlays much of the Project Area. Also, prevalent are rocks of the Franciscan Complex, a mixture of chert, basalt, shale, metamorphic rocks, and mélangé created by subduction zone processes.

However, the rocks that best define the crests and slopes of the upper watersheds in the Project Area belong to the Sonoma Volcanics (Sloan 2006). This rock grouping includes lavas, mudflows, and tuffs that erupted or spread in the Miocene epoch between about nine and three million years ago. Compared to some of the sedimentary rocks in the region, these volcanics are more resilient and durable, which explains their prominence along ridgelines. Sonoma volcanics are observed in the headwaters for several of the Project Area's streams in the Mayacamas and Sonoma ranges. Further to the west, including Petaluma, sandy sediments were deposited in a shallow marine environment that transformed into sandstone.

The history of tectonism, volcanism, and their various mountain uplifting and basin subsidence processes are important to consider as background for the Proposed Project. These past processes provided the basic earth materials that are now eroded and carried in today's lowland creeks. Of even more relevance to the Proposed Project is the geologic history of the last two million years, known as the Quaternary period, which is comprised of the Pleistocene epoch (two million years to 10,000 years ago) and the Holocene (the last 10,000 years).

In the Petaluma River watershed, many of the lowland creeks are built onto medium-textured alluvium of the Petaluma plain. In the Sonoma Creek watershed, the main arm of Sonoma Creek flows south along the coarser sediments of the valley floor. Several older Pleistocene terraces also run throughout the valley, but are located further from the creek. Interestingly, the east side of Sonoma Valley includes abundant colluvium. Colluvium is sediment or rock that is deposited at the base of a slope by gravity or sheetwash, but it is not transported by channelized flow like in the case of alluvium. Though dependent on specific site and land use conditions, colluvium is typically highly erosive and can often enter neighboring streams.

Soils

Soils in the Project Area are varied, derived from diverse landform, geologic, climatic, and biologic conditions. The Soil Survey of Sonoma County (U.S. Department of

Agriculture 1990) includes 15 soil associations. At the association level, soils are generally distinguished according to their geomorphic and topographic setting; whether they are located in basins, tidal flats, floodplains, terraces, alluvial fans, high terraces, foothills, uplands, and mountains. In general, the soils in the lowland basins, floodplains, and alluvial fans range from gravelly sandy loams to clays; most often composed of clays and clay loams that formed in alluvium from sedimentary and volcanic material. These soils vary in drainage capacity from poor to excessive, with the more clay-textured soils draining more poorly. The soils on the high terraces, foothills, uplands, and mountains consist of gravelly to stony sandy loams to clay loams and range in drainage capacity from moderate to excessive, with the coarser textured soils draining better.

While inherent erodibility is important in considering a soil's potential erosion, often it is the slope, type of land use, and intensity of land practices which are the more important determinants of potential erosion. Most of the headwater source regions in the Project Area have high erosion potential.

3.4 Climate and Precipitation

Climate of the Project Area is characterized as two-season Mediterranean with cool wet winters and warm dry summers. Annual and seasonal variability in temperatures and rainfall are high. Spring and summer prevailing southwesterly-westerly winds in the Project Area are influenced by cool and moist coastal marine air. Summer average daily maximum temperatures in the Petaluma Valley are in the low to mid 80s, while winter average daily minimum temperatures are in the high 30s to low 40s. Prevailing winds in Petaluma Valley are westerly through the coast. Marine air and winds descend across the Petaluma Valley and can flow north or south toward San Pablo Bay.

Prevailing winds in Sonoma Valley tend to be from the south during the day when warming conditions create an up-valley flow. At night the pattern is reversed where cooler air in the northern Sonoma Valley and from the side valley canyons descends to the valley floor and flows southward down the valley. Further east and insulated from the maritime coastal air, Sonoma Valley is warmer than the Petaluma watershed and experience average summer temperatures in the high 80s. Average daily winter minimum temperatures are in the high 30s.

Precipitation primarily falls between November and March and varies across the Project Area. Winter storm fronts typically arrive from the west, but this can range from the south-southwest to northwest directions. Fronts experience orographic lifting and increased precipitation in crossing the Mayacamas and Sonoma mountains. The lee side of these ranges typically experiences a rain-shadow effect and reduction in precipitation. Average annual rainfall in the Petaluma Valley is 26 inches with the surrounding higher slopes in the watershed receiving 28-30 inches. Rainfall amounts in Sonoma Valley gradually increase from south to north, with 22 inches at the San Pablo

Bay margin increasing to 40 inches to the northern valley. Rainfall amounts also increase up to 50 inches at Sonoma Mountain located between Zones 2A and 3A.

3.5 Surface Water

The hydrologic cycle describes the movement and storage of water across the atmosphere, the land surface, the subsurface, and the ocean basins. Surface water hydrology represents the portion of the hydrologic cycle that is in movement or storage across the land surface and is typically thought of as runoff and streamflow. Runoff is a broad category and includes a range of flows progressing from sheetwash or overland flow, to initial collection of flows in small rills and land creases. Streamflow identifies the larger concentration of flows in natural creeks or engineered channels.

The amount and timing of runoff and streamflow over a given time period (storm event, season, or year) reflect a region's and watershed's climate, topography, geology, and soil conditions. Steeper surfaces shed runoff more quickly than flatter surfaces. Soil attributes of porosity and permeability influence how precipitated water on the land surface will infiltrate the ground to be either stored as soil water, travel through the soil towards a creek as interflow or throughflow, or infiltrate deeper to groundwater depending upon geologic conditions.

Surface water that is not infiltrated, evaporated, or transpired (taken up by plants) is available as runoff to streams. In the Project Area streams may be ephemeral (conveying flows only immediately after a storm event); intermittent (conveying flows seasonally and supported by shallow groundwater); or perennial (flowing year round and supported through deeper groundwater sources or human sources such as reservoirs, release of imported flows, urban runoff, or irrigation).

Within the Project Area, first-order and second-order stream headwater tributaries vary in their flow conditions from ephemeral to perennial. Surface hydrology in these upper watershed streams is a function of watershed size, underlying geology, recent precipitation conditions, and land use. Medium sized tributaries (third and fourth-order streams) that collect flows out of the primary upper headwater canyons are generally intermittent but may be perennial. The larger named creeks that emerge from the upland canyons and alluvial fans and carry enough flows to cross the valley floors and plains without losing all their flows to percolation are typically perennial. Flow characterizations for creeks, particularly the seasonal duration of intermittent flow, varies according to climatic conditions and how wet or dry the current and past one or two years have been. Additionally, while some channels may not flow perennially, they may sustain cold-water pools throughout the year (particularly where substrate, shading, and groundwater conditions are favorable) that can provide important habitat for many species.

The urban, suburban, agricultural, or commercial development of the land surface directly affects the hydrologic cycle and infiltration and runoff conditions. In developed areas with higher proportions of impervious surfaces, infiltration is greatly reduced and storm runoff increased.

3.6 Groundwater

Groundwater originates from rainfall that infiltrates and percolates through the soil layer into subsurface rock materials that can hold water. When saturated these subsurface rock materials can act as reservoirs that are known locally as aquifers or more regionally as groundwater basins. Aquifers tend to be associated with porous and permeable sedimentary rocks or alluvium that have higher water-bearing capacities, but groundwater can also be held in less porous igneous or metamorphic rocks that have permeability through large joints or fractures. Faults can provide another avenue for subsurface water to collect and migrate. In the Project Area, groundwater is an important water supply resource supporting municipal and agricultural uses in the Sonoma and Petaluma valleys.

Groundwater sources in the Project Area include fractures in the Sonoma Volcanics in the eastern watersheds and the coarse fluvial deposits of the Glen Ellen Formation in Sonoma Valley (U.S. Geological Survey 2007). In addition to these rock unit source areas, the abundant alluvium in the Project Area supports groundwater.

Many of the lowland creeks in the Project Area are important recharge corridors directly to aquifers below. The earthen beds of creeks, often comprised of coarse-grained sands, gravels, and cobble, provide excellent recharge capacity. The Petaluma River alluvial plain was identified as key recharge streams but many additional earthen bed creeks across the alluvial plains and fans of the Project Area provide similar functions.

3.7 Water Quality

This section presents an overview of water quality conditions related to sediment and temperature in the Project Area.

Erosion and Sediment

Watersheds are nested systems where a range of sedimentary processes naturally occur as materials move from higher to lower locations. Sediments can be stored in place, eroded (i.e., initiated into movement downslope or downstream), transported, or deposited. A standard, though simplified, geomorphic approach classifies watersheds into three general zones: (1) a source zone of sediment production, (2) a transport zone where sediments are generally carried, and (3) a depositional zone typically downstream in the basin where sediments are more likely to come to rest. This three-part classification generally works well for the Petaluma River and Sonoma Creek watersheds of the Project Area. In general, the surrounding mountains act as source

areas, the canyons and upper alluvial fans serve as transport zones, and the lower alluvial fans, plains, and valley bottoms operate as depositional zones. While generally true, the simplified three-part classification can obscure several of the erosive, transport, or depositional possibilities observed at more local scales throughout the watershed. Looking at processes in closer detail, sediments can be variably eroded, stored, or transported throughout the entire system, whether in the farthest upstream tributaries, mid-watershed fans and watershed plains.

As introduced above, there are several physical and biological conditions that influence erosion and sediment processes in a watershed, including geologic structure, tectonism, and properties; topography and slope; climate and precipitation; soils and vegetation; and the hydrologic conditions of infiltration, runoff, and streamflow.

On top of these physical influences, land use practices and structures further influence erosion and sediment processes. The intensification of land uses through agriculture, grazing, fire management, mining, recreation, or residential and commercial development in the Project Area has resulted in increased erosion. Under urbanization, the cause and effect between land use and erosion can be direct as in the following sequence: development reduces infiltration, increases runoff and streamflow, increases sediment delivery to streams, increases in-channel bed/bank erosion and transport, increasing sediment yield downstream. Or, with more agricultural land uses, increases in erosion and sediment delivery may occur without the large increases in streamflows observed with urbanization. In such a case, increased erosion may lead to net channel aggradation, at least locally, because there is not adequate streamflow to carry the material downstream.

Regulatory Sediment Issues

Petaluma River and Sonoma Creek are currently identified by federal and state regulatory agencies as being impaired by excessive sediment (State Water Resources Control Board 2006). Degradation of these water bodies has been attributed to agricultural practices (grazing, crop production, and dairies are the primary sources) and land development activities (including residential/commercial development resulting in hydromodification, stream channelization, and reduced floodplain connectivity). The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) developed a Total Maximum Daily Load (TMDL) and implementation plan to address sediment impact in the Sonoma Creek watershed. Also, SFRWQCB is developing a Stream and Wetland Protection Policy to achieve water quality standards and protect beneficial uses.

Temperature

Parameters that influence stream temperature include ambient air temperature, humidity, riparian vegetation, topography, surrounding land use, and flow conditions.

Additionally, cold water seeps and groundwater inputs contribute to moderating and lowering stream water temperatures. Among these parameters, direct solar radiation on the water surface is perhaps the most influential factor in raising water temperature. Consequently, shade provided by riparian vegetation often controls water temperature. Water temperature influences a number of chemical processes within water bodies. Dissolved oxygen capacity is inversely related to water temperature. As water temperature rises, the maximum potential concentration of dissolved oxygen reduces. This affects the growth and decay rate of aquatic species that rely on high dissolved oxygen concentrations for survival.

Streams in Mediterranean climates, such as Sonoma County, experience seasonally reduced flows in summer, resulting in higher water temperatures. Additionally, land development often results in removal of riparian shading, reduced cold-water inputs (i.e., altered groundwater supplies), increased sediment deposition due to channel modifications, and increased surface runoff. All of these factors alter channel geomorphology, which in turn create conditions that can cause water temperatures to rise to levels that degrade habitats for cold water species. While shading creeks may help decrease water temperatures, it is important to note that runoff received from urbanized areas may exhibit relatively high water temperatures compared to runoff received from non-urbanized areas. Additionally, summer air temperatures in Sonoma County are capable of exceeding 90 degrees F. Under such conditions, given the narrow width of the riparian corridor, shading of the creek may only modestly reduce creek water temperatures. It is also important to note that streams flowing across the valley floor often naturally have relatively warm water temperatures. These conditions are not necessarily indicative of poor water quality and can provide important habitat opportunities for native warm water fish assemblages.

Water temperature is a key constituent for assessing the quality of habitat within areas that support anadromous fish. Steelhead (*Oncorhynchus mykiss*), coho salmon (*Oncorhynchus kisutch*), and Chinook salmon (*Oncorhynchus tshawytscha*) are highly sensitive to temperature and require cold water throughout the majority of their life stages. Habitat for cold-water anadromous fish species, including steelhead trout and coho and Chinook salmon is present in the Project Area. However, the majority of the cold-water perennial creeks in the Project Area are more characteristic of spawning and rearing habitat for steelhead then for coho and Chinook salmon.

3.8 Plant Communities and Habitats

This section presents a description of plant communities and habitat types in the Project Area. Land cover and natural communities occurring in the Project Area were categorized into eight primary types, as follows:

- Willow Scrub

- Riparian Forest and Woodland
- Mixed Riparian Scrub
- Emergent Wetland
- Blackberry Scrub
- Ruderal
- Developed
- Aquatic

Invasive species are common in these natural communities in the Project Area and are commonly characteristic of the surrounding residential and agricultural areas. Seeds and vegetative fragments from these invasive species are carried into the Project Area by tributary flows, wind, animals, and by residents. Monitoring and controlling invasive species is an important ongoing maintenance activity that is necessary to maintain and enhance habitat value and flood control in the Project Area.

The channels and associated natural communities in the Project Area provide valuable habitat for many common and special status plant and animal species. Many of the common and special status species with potential to occur in creeks are discussed together with the natural communities in which they are found. A more detailed discussion of the special status species with potential to occur in Project Area creeks is provided below in *Special Status Plants, Wildlife, and Fish*.

Willow Scrub

Willow scrub in the Project Area is typically located on the banks and sandbars of perennial drainages. Within the Project Area stands of willow scrub, riparian trees and shrubs would be best characterized as Central Coast Riparian Scrub. As described by Holland (1986) Central Coast Riparian Scrub is a scrubby streamside thicket, varying from open to impenetrable, dominated by any of several willow species. This early seral community may succeed to any of several riparian woodland or forest types in the absence of severe flooding disturbance. This community occurs on relatively fine-grained sand and gravel bars adjacent to river channels and therefore close to groundwater.

Willow scrub is dominated by dense growths of a number of willow species, including red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), and Pacific willow (*Salix lucida lasiandra*). Box elder (*Acer negundo*) and California black walnut (*Juglans californica*) are frequently minor components of willow scrub, as well. Sandbar willow (*Salix exigua*) is also common in willow scrub, particularly in areas that are recently disturbed. The herbaceous layer within willow scrub is typically sparse. Openings in willow scrub are commonly dominated by non-native herbaceous species, such as

various brome grasses (*Bromus sp.*), Italian rye (*Lolium multiflorum*), wild oat (*Avena sativa*, *A. barbata*), Harding grass (*Phalaris aquatica*), hemlock (*Conium maculatum*), teasel (*Dipsacus fullonum*), and bristly ox-tongue (*Picris echioides*).

Several common wildlife species can be associated with willow scrub, including amphibians such as Pacific treefrog (*Pseudacris regilla*) and western toad (*Anaxyrus boreas*). Ring-necked snake (*Diadophus punctatus*), common garter snake (*Thamnophis sirtalis*), and western terrestrial garter snake (*Thamnophis elegans*) are also found in scrub and forest in or along streams. Common birds such as California thrasher (*Toxostoma redivivum*) and western scrub jay (*Aphelocoma californica*) use willow scrub habitats for nesting. It is common for mammals to use these riparian areas for corridors during dispersal and while foraging.

Riparian Forest and Woodland

Riparian forest and woodland in the Project Area is found on the banks of perennial drainages between the shoreline and top-of-bank. This community may include many non-native tree species performing a riparian function. Riparian forest and woodland is dominated by a variety of tree species. Coast live oak (*Quercus agrifolia*) and valley oak (*Quercus lobata*) are the most common species in riparian woodland. Other common species include Oregon ash (*Fraxinus latifolia*), California black walnut, Fremont cottonwood (*Populus fremontii*), and white alder (*Alnus rhombifolia*). Larger trees are commonly found at the upper bank, while shorter willows or alders may be found growing near the shoreline. The herbaceous understory of riparian woodland along the flood control channels is typically dominated by non-native species that are also dominant in ruderal areas, such as brome grasses, Italian ryegrass, English and Algerian ivy (*Hedera helix*, *H. canariensis*), periwinkle (*Vinca major*), Himalayan blackberry, Harding grass, bristly ox-tongue, and sweet fennel (*Foeniculum vulgare*).

The non-native blackberry and periwinkle (*Vinca sp.*) are frequently interspersed with riparian woodland or present as an understory along the banks in reaches where mature trees are present at the top of the bank.

Riparian forest and woodland was classified into four sub-categories based on the degree of canopy closure over the stream channel. Areas with greater canopy closure provide more shading of the streams, enhancing habitat for fish and other wildlife species and reducing the growth of wetland vegetation in the channel. Greater canopy closure is therefore typically associated with higher quality aquatic habitat for many fish and wildlife species. Riparian habitat quality is also enhanced by more mature trees with greater canopy closure. However, riparian habitat quality also depends on the degree of development of herbaceous, shrub and subcanopy layers. In some cases, riparian woodland with a high degree of canopy closure may consist of one or two rows of mature trees at the top of the bank, without a shrub or subcanopy layer.

A well-developed riparian woodland overstory and dense vegetative cover in the understory provide habitat for several wildlife species. Several species of nesting songbirds utilize riparian forest and woodland. Several commensal species of mammals, including raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), and striped skunks (*Mephitis mephitis*) flourish in riparian forests that are in close proximity to human disturbance. Additionally, many bird species associated with oak woodland habitats, such as oak titmouse (*Baeolophus inornatus*) and acorn woodpecker (*Melanerpes formicivorus*), are also found in riparian woodlands.

Western toad, Pacific treefrog, ring-necked snake, common garter snake, and western terrestrial garter snake, discussed above under Willow Scrub, may also be found in riparian forest and woodland. California giant salamanders (*Dicamptodon ensatus*) may utilize riparian forest along small streams relatively high in the watersheds. Riparian forest and woodland also provide habitat for species such as black-tailed deer (*Odocoileus hemionus*).

Wildlife habitat is greatly enhanced by riparian vegetation, which provides shade, food, and nutrients for algae and aquatic invertebrates that form the basis of the food chain. Coarse woody debris from riparian trees and shrubs is also an important feature of in-stream habitat, forming scour pools and log jams used by amphibians, insects, and fish. Riparian forests and woodland may be the most important habitat for California bird species, providing breeding and overwintering habitat, migration stopover areas, and movement corridors (Riparian Habitat Joint Venture 2004). The quality of riparian wildlife habitat is enhanced by multilayered, structurally complex vegetation, including canopy trees and a shrub layer, and food sources such as berries and insects.

Mixed Riparian Scrub

Mixed riparian scrub occurs along the banks of creeks of some perennial and intermittent drainages. Mixed riparian scrub is characterized by a shrub layer dominated by Himalayan blackberry, coyote bush (*Baccharis pilularis*), and saplings of valley oak, California black walnut, and arroyo willow. An herbaceous layer is present in between patches of shrubs, dominated by Harding grass, Fuller's teasel, bristly ox-tongue, wild oats (*Avena* spp.), and Mediterranean mustard (*Hirschfeldia incana*).

Commensal species discussed above, such as striped skunk, opossum, and raccoon, may use mixed riparian scrub. Western toad, Pacific treefrog, common garter snake, and western terrestrial garter snake, also discussed above, may too be found in mixed riparian scrub. Other previously discussed species—red-winged blackbird, common yellowthroat, and song sparrow—will also use these habitats for nesting. Deer and wild turkey may use mixed riparian scrub for movement corridors, foraging, and daytime loafing.

Emergent Wetlands

Emergent wetlands in the Project Area occur as a narrow fringe along the margins of some drainages, or as patches or dense stands in other drainages.

Emergent wetland are dominated by a variety of species, including rice cutgrass (*Leersia oryzoides*), giant bur-reed (*Sparganium eurycarpum*), common water plantain (*Alisma plantago-aquatica*), common threesquare (*Scirpus pungens*), river bulrush (*Scirpus fluviatilis*), hardstem bulrush (*Scirpus acutus*), torrent sedge (*Carex nudata*), and cyperus species, including red-rooted cyperus (*Cyperus erythrorhizos*). Associated species include smartweed (*Polygonum hydropiperioides*) and the nonnative mint (*Mentha* spp.) and willowherb (*Epilobium ciliatum*). Also, many creek reaches in the lowland Project Area are characterized by dense stands of cattail (*Typha* spp.), with bulrush or tule (*Scirpus* spp.) as a significant but less common component.

Pacific treefrog and western toad, discussed above, may also be associated with emergent wetland vegetation. Birds such as red-winged black birds, Virginia rails (*Rallus limicola*), and soras (*Porzana carolina*) may utilize dense freshwater marsh vegetation. Cattail wetlands are utilized extensively by muskrats (*Ondotra zibethica*). Where muskrat populations are large, foraging may be an important factor in maintaining open water areas. In addition, cattail fruits are utilized by terrestrial birds for nesting material, and their stems may be used by aquatic birds.

Blackberry Scrub

Blackberry scrub is located on the banks of some intermittent and perennial drainages in the Project Area. In some cases, blackberry scrub forms a understory in open riparian woodlands. It is characterized by a dense growth of Himalayan blackberry, which is native to Eurasia.

As noted in the discussion of mixed riparian scrub above, areas with dense blackberry patches often attract species such as red-winged blackbird, common yellowthroat and song sparrow. Also, this habitat is favored by Norway rats (*Rattus norvegicus*) for food and shelter.

Ruderal

Ruderal vegetation in the Project Area is found in the channels of smaller intermittent drainages, and on and above the banks of many intermittent and perennial drainages. Ruderal vegetation is an assemblage of plants, often a mixture of both native and non-native weed species that thrive in waste areas, heavily grazed pastures, cultivated and fallow fields, roadsides, parking lots, footpaths, residences and similar disturbed sites in towns and cities and along rural roadways. In areas of frequent human disturbance, the majority of wild plants are often introduced weeds rather than natives. However, ruderal species may at times be integrated into other communities. Ruderal vegetation frequently forms the understory of riparian woodland. Ruderal vegetation in the Project

Area varies depending on the site hydrology. In more mesic areas, such as the creek banks of perennial drainages, ruderal vegetation is dominated by Harding grass, Italian rye grass, various brome grasses, wild oat, star thistle (*Centaurea solstitialis*), Italian thistle (*Carduus pycnocephalus*), hemlock, Bermuda grass (*Cynodon dactylon*), bristly ox-tongue, velvet grass (*Holcus lanatus*), and Fuller's teasel. In drier areas, adjacent to intermittent drainages or on the outer edges of access roads, ruderal vegetation is dominated by species such as sweet fennel, wild oats, Mediterranean mustard, and wild radish (*Raphanus sativus*).

Ruderal vegetation may be used for movement and foraging by wildlife species discussed above that are tolerant of chronic human disturbance. In addition, ruderal areas may provide foraging areas for raptors. Openings in the riparian forest or woodland canopy in the Project Area are typically characterized by ruderal vegetation or mixed riparian scrub. Maintaining some open areas in riparian woodland enhances habitat function by increasing structural heterogeneity and providing foraging and basking areas for some wildlife species.

Developed

Developed portions of the Project Area include access roads, drainage ditches, in-channel structures including culverts, bicycle trails, and supporting infrastructure located adjacent to drainages. These areas are largely unvegetated, although some canopy from trees lining the road may be present. Along many reaches some landscaping may also be present. Drainage ditches may be bare, but also sometimes support ruderal grasses. Developed land covers provide low quality habitat for species that are adapted to chronic human disturbance.

Aquatic

Aquatic communities are discussed in terms of intermittent and perennial drainages. The many hydrologic and geomorphic processes that influence streamflow and sediment conditions in the aquatic environment are discussed above. A key process for understanding aquatic environments in the Project Area is the relationship between in-channel sedimentation and the growth of marsh or willow scrub vegetation. In areas of abundant in-channel sedimentation, particularly areas with medium and finer sediments (finer than coarse sands), cattail marsh or willow vegetation will often colonize. This typically happens in locations where the channel gradient has lessened (perhaps just upstream or downstream of a crossing or in-channel structure) and sediments collect either as in-channel bars, or as a broad depositional wedge across the entire channel width. Under such depositional conditions, and especially when there is little shade and the area is very sunny, the marsh and willow vegetation establish quickly. The positive feedback between low gradient reaches creating a depositional environment, which then attracts and fosters aquatic vegetation, which in turn traps more sediment, has several management implications.

Intermittent Drainages

Smaller intermittent drainages with lower flows support primarily ruderal vegetation in their channels and along their banks. Larger intermittent drainages support in-channel emergent wetland vegetation. Emergent wetlands in intermittent drainages with little or no canopy cover may be dominated by dense stands of cattails. The location and extent of in-channel vegetation in intermittent drainages varies depending on the nature of the channel and the nature and timing of vegetation management activities in the channel. In-channel vegetation may be limited to a narrow fringe of wetland vegetation along the low-flow channel, or it may form a dense to open stand filling the channel. The upper banks of larger intermittent channels support blackberry scrub or ruderal vegetation.

Perennial Drainages

As is the case in intermittent drainages, the location and extent of vegetation within the channels of perennial drainages vary. In channels with steeper gradients, more rapid flows and more scour, vegetation may be limited to a narrow fringe of wetland vegetation along the low-flow channel. In channels with gentler gradients, vegetation often forms a dense stand that fills the channel.

Smaller perennial drainages and upper reaches of larger perennial drainages are characterized by low flows at the end of the dry season. Vegetation in and along these channels is similar to the vegetation described above in larger intermittent drainages.

Many large perennial drainages lack significant in-channel vegetation. In-channel vegetation in some perennial drainages consists of stands of cattails or water plantain. In other drainages sand and gravel bars have formed. These features support a variety of vegetation communities. Recently established gravel bars support ruderal vegetation, much of which is not hydrophytic, dominated by species such as white sweet clover (*Melilotus alba*). Older sand and gravel bars are typically characterized by willow scrub. Many large perennial drainages, such as Sonoma Creek, support a band of willow scrub located at and above the shoreline and often have a good complement of riparian forest trees. Riparian forest in these drainages shades a portion of the open channel, reducing the growth of in-channel vegetation.

3.9 Special Status Plants, Fish, and Wildlife

A list of federally endangered and threatened species that may occur in the Project Area was obtained from the U.S. Fish and Wildlife (USFWS) website (USFWS 2015). The California Natural Diversity Database (CNDDDB) and the California Native Plant Society (CNPS) electronic inventory were also queried. The CNDDDB, CNPS, and the USFWS search results for the Proposed Project are listed in Tables A-3 and A-4 in the Appendix. These tables of special status species also include information on each species' habitat requirements, Critical Habitat (if designated), and the likelihood that

those habitats are present within the Project Area. In evaluating the occurrence potential of special status plant and wildlife species in the Project Area, relevant literature, knowledge of regional biota, and observations made during the field investigations were applied as analysis criteria.

3.10 Project Alternatives

The No Project alternative would mean that the Proposed Project's flood control maintenance activities would not be implemented by the Water Agency and private property owners would be responsible for activities. This would likely result in no action and possible degradation of the environment from erosion or property owners performing activities on their own without incorporating appropriate BMPs. The latter may occur because the typical property owner is unaware of current regulations or the permitting process is too onerous or expensive. A reduced project alternative of implementing flood control maintenance in either Flood Control Zone 2A or 3A would likely result in environmental degradation in the unmaintained Zone.

3.11 Conformance with the General Plan

The Project Area is subject to the land use policies and designations adopted in the Sonoma County General Plan 2020 (SCPRMD 2008) that contains a variety of goals, objectives, policies, programs, and implementation measures, which address several environmental resources and concerns including biological, cultural resources, geologic hazards, hazards and hazardous materials, water quality, noise, public services and utilities, and transportation and traffic. The Proposed Project appears to be consistent with applicable general plans and policies and would not limit or restrict any existing activities that occur in the Project Area. Also, the Water Agency would comply with County ordinances and zoning codes. Under Ordinance No. 3836R, the County of Sonoma issues roiling permits for work conducted within riparian corridors. Activities of the Proposed Project would occur within riparian areas. Water Agency would comply with this ordinance by receiving a permit prior to project implementation, as necessary. Also, County of Sonoma Zoning Code Regulation Article 65 (Riparian Corridor Combining Zone) Section 26-65-040 allows several activities including "stream maintenance and restoration carried out or overseen by the Sonoma County Water Agency."

3.12 Jurisdictional/Permitting Agencies

The following are public entities and agencies that may require review of the project or that may have jurisdiction over the Project Area:

- U.S. Army Corps of Engineers
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service

- California Department of Fish and Wildlife
- California Regional Water Quality Control Board, San Francisco Bay Region
- Sonoma County Permit and Resources Management Department

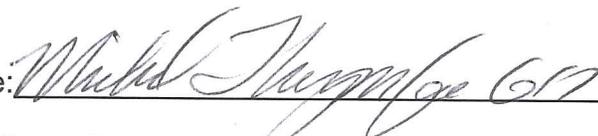
3.13 Determination

Based on the finding of this Initial Study, the General Manager of the Sonoma County Water Agency has determined that the Proposed Project would not have a significant effect on the environment. Significant impacts have been largely avoided by incorporating Best Management Practices (BMP) into the Proposed Project.

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

Signature: _____



Date: 12/21/12

Grant Davis - General Manager

4.0 Environmental Checklist

The Proposed Project’s environmental impacts were assessed based on the environmental checklist provided in Appendix G to the CEQA Guidelines as revised in 2009. The checklist provides a summary of potential impacts that may result from implementation of the Proposed Project. In addition, each section includes a discussion of the rationale used to determine the significance level of the Project’s environmental impact for each checklist question. For the purpose of impact analysis the term “Project Area” is defined as all natural reaches of streams and associated aquatic and riparian habitats located within the Flood Control Zones 2A and 3A, excluding streams covered under the Water Agency’s SMP. A list of environmental factors and summary of findings are below. The findings of each environmental analysis are included in Sections 4-1 through 4.18.

Environmental Checklist and Summary of Potential Impacts

| Environmental Factor | Potentially Significant Impact | Less than Significant with Mitigation | Less-than-Significant Impact | No Impact |
|---------------------------------|--------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|
| Aesthetics | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Agriculture Resources | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Air Quality | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Biological Resources | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Cultural Resources | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Geology, Soils, and Seismicity | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Greenhouse Gas Emissions | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Hazards and Hazardous Materials | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Hydrology and Water Quality | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Land Use and Planning | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Mineral Resources | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Noise | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Population and Housing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Public Services | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Recreation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

| Environmental Factor | Potentially Significant Impact | Less than Significant with Mitigation | Less-than-Significant Impact | No Impact |
|------------------------------------|--------------------------------|---------------------------------------|-------------------------------------|--------------------------|
| Transportation and Traffic | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Utilities and Service Systems | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Mandatory Findings of Significance | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

With regard to the checklist, a “No Impact” response indicates that no impact would result from implementation of the project. A “Less Than Significant Impact” response indicates that an impact is involved, but is at a level which is less than significant. A “Less Than Significant With Mitigation” response indicates that an impact may potentially be significant, but the incorporation of mitigation measures would reduce the impact to a level of insignificance. A “Potentially Significant Impact” response indicates that impacts may be significant if mitigation measures are unknown, infeasible, or not proposed. Each response is discussed at a level of detail commensurate with the potential for adverse environmental effect.

4.1 Aesthetics

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|---|--------------------------------|--|-------------------------------------|-------------------------------------|
| Would the project: | | | | | |
| a. | Have a substantial adverse effect on a scenic vista? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Substantially damage scenic resources, including trees, rock outcroppings, and historic buildings along a scenic highway? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | Substantially degrade the existing visual character or quality of the site and its surroundings? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a. Adverse Effects on Scenic Vistas — *Less than Significant*

Scenic viewpoints within the Project Area are generally located at high elevations along mountain ranges and hillsides that surround the Petaluma and Sonoma valleys, or at locations along the valley floors which afford clear views of the valley and adjacent hills (SCPRMD 2008). The proposed maintenance activities would be conducted within channel corridors which are situated at lower elevations in the watershed. Due to their location and often the presence of confining vegetation, it is unlikely that stream maintenance activities would have a pronounced effect on scenic vistas from these viewpoints.

Proposed maintenance activities would involve minimal use of heavy equipment and would occur only temporarily during daytime hours on weekdays. These activities are not anticipated to reduce the quality of views within channels or from nearby adjacent lands. Maintenance activities are performed in a manner to restore channel capacities and natural function. Only the minimum maintenance necessary would be performed at project locations, and feasible actions to protect and enhance riparian ecology would be implemented (including revegetation as applicable). Activities would not result in the

construction of any structures or facilities that would block views of surrounding scenic vistas.

Due to the low-disturbance manner in which activities would be performed and the overall small-scale of projects undertaken, the impact on scenic vistas would be less than significant. No mitigation is required.

b. Damage to Scenic Resources along a Scenic Corridor — *Less than Significant*

The Proposed Project would not result in any long-term damage of scenic resources. No mature trees would be removed during construction, although fallen trees may be repositioned in a creek, trimmed, or removed. No rock outcroppings or historic buildings of visual significance would be removed while implementing the Proposed Project.

Proposed maintenance activities may occur in channels which intersect with, or are adjacent to, designated scenic roadways. Maintenance activities conducted at roadside crossings would be minimal, occurring on an as-needed basis, and typically include the removal of debris jams and the clearance of vegetation to remove significant flow obstructions.

The Proposed Project's BMPs identified below and described in Table 2 would avoid or minimize visual impacts during maintenance.

- BMP GEN-2: Staging and Stockpiling of Materials
- BMP GEN-3: Channel Access
- BMP BR-3: Biotechnical Bank Stabilization
- BMP GN-1: Work Site Housekeeping
- BMP VEG-2: Planting and Revegetation After Soil Disturbance

While the presence of maintenance equipment in these locations could temporarily disrupt scenic views, such disruption would be temporary. The use of heavy equipment would be minimal and work activities are generally completed within a few days. Any physical changes to the channels would not substantially affect their aesthetic quality, since such changes would be infrequent, of limited spatial extent, and would quickly return to a "natural" appearance over the course of a growing season.

Because maintenance activities would be short-term and visual disruptions along scenic corridors would be temporary, there would be no substantial or long-term degradation of the scenic resources as viewed by the various viewer groups. This impact would be less than significant. No mitigation is required.

c. Changes to Existing Visual Character or Quality — *Less than Significant Impact*

The visual character and quality of creek channels potentially maintained under the Proposed Project vary widely, from densely vegetated riparian corridors to sparsely vegetated seasonal creeks. Viewing opportunities would be limited due to project

locations on private property but may be viewed by a range of vantage points from nearby or crossing roadways. The Proposed Project's BMPs identified below and in Table 1 minimize adverse visual impacts associated with temporary disturbances.

- BMP GEN-2: Staging and Stockpiling of Materials
- BMP GEN-3: Channel Access
- BMP BR-3: Biotechnical Bank Stabilization
- BMP GN-1: Work Site Housekeeping
- BMP VEG-2: Planting and Revegetation After Soil Disturbance

While proposed maintenance activities could result in a temporary degradation of visual quality, the overall long-term effect of the Proposed Project would improve the visual quality and character of the Project Area.

Although viewer response to altered channel areas after maintenance activities may vary, temporary degradation of visual quality due to site disturbance would be less than significant given the temporary nature and small scale of the projects. No mitigation is required.

d. New Sources of Light or Glare — *No Impact*

The Proposed Project's maintenance activities would be conducted during daylight hours only (BMP GN-2), thus no nighttime lighting would be needed. The Proposed Project would not involve construction of new facilities or modifications to existing facilities that would result in new reflective surfaces or installation of lighting. Consequently, there would be no impact and no mitigation is required.

4.2 Agricultural Resources

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|---|--------------------------------|--|------------------------------|-------------------------------------|
| <p>In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation (DOC). In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.</p> <p>Would the Project:</p> | | | | |
| 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 (FMMP) of the California Resources Agency, to nonagricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Conflict with existing zoning for agricultural use, or a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

4.2 Agricultural Resources

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--|--------------------------------|--|------------------------------|-------------------------------------|
| 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))? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. Result in the loss of forest land or conversion of forest land to non-forest use in a manner that will significantly affect timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, or other public benefits? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. Involve other changes in the existing environment that, because of their location or nature, could result in a conversion of Farmland to a nonagricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a-e. Conflicts or Loss of Agricultural or Forest Lands — No Impact

Farmland, agricultural, and designated forest lands may be located in proximity to the Proposed Project's creeks; however, all activities would take place within creek channels and immediate top of banks.

The Proposed Project activities focus exclusively on channel maintenance and enhancement, and would not alter land use designations or farmland/timberland classifications at either the local or state level. Furthermore, the maintenance actions would not create pressure for future land conversions.

No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, forest lands, or lands under a Williamson Act contract would be converted by, or conflict with, maintenance activities. Rather, the Proposed Project is likely to contribute to a long-term benefit to agriculture and timberlands by reducing regional flooding and improving channel stability.

4.3 Air Quality

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--|--------------------------------|--|-------------------------------------|--------------------------|
| When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project: | | | | |
| a. Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. Expose sensitive receptors to substantial pollutant concentrations? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. Create objectionable odors affecting a substantial number of people? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a, b. Conflicts with or Violates Applicable Air Quality Plans or Standards — *Less than Significant*

The Federal Clean Air Act is implemented by the U.S. Environmental Protection Agency and sets ambient air limits, the National Ambient Air Quality Standards (NAAQS), for six criteria pollutants: particulate matter, carbon monoxide, nitrogen oxides (NOx), ground-level ozone and lead. Of these criteria pollutants, particulate matter and ground-level ozone pose the greatest threat to human health. The California Clean Air Act is implemented by the California Air Resources Board (CARB) and sets State air quality standards, the California Ambient Air Quality Standards (CAAQS). The CARB sets standards for criteria pollutants that are more stringent than NAAQS, and includes the

following additional contaminants: visibility reducing particles, sulfates, and vinyl chloride. The Project Area is located within the San Francisco Bay Area Air Basin (SFBAAB), which includes all or portions of the nine-county Bay Area. The Bay Area Air Quality Management District (BAAQMD) manages air quality within the SFBAAB for attainment and permitting purposes.

The BAAQMD has also developed thresholds of significance for criteria air pollutants, which were published in the BAAQMD's *California Environmental Quality Act Air Quality Guidelines* (2011). Table 4 provides the BAAQMD's recommended significance criteria for analysis of air quality impacts, including cumulative impacts. The term "sensitive receptor" is used by the BAAQMD to refer to facilities or land uses that include members of the population particularly sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses. Examples of sensitive receptors within the Project Area include schools, hospitals and residential areas.

Use of vehicles and off-road equipment, such as wood chippers and excavators, for maintenance activities would generate emissions of criteria air pollutants. Fuel combustion involved with vehicle use and operating off-road equipment would release particulate matter (PM_{2.5} and PM₁₀) and other contaminants associated with motor vehicle operation, including carbon monoxide and ozone precursors (reactive organic gases [ROG] and NO_x).

The Proposed Project would require use of a variety of vehicles (light- and heavy-duty pickups and an excavator) and equipment (such as chain saws and wood chippers). Although some proposed activities would be conducted year-round, the majority of work would be conducted between June 15 and October 31. On average, the maximum duration of any maintenance activity is approximately 3 days. A typical activity will consist of two light-duty trucks and one heavy-duty truck/chipper or excavator. Thus, approximately 6-8 vehicle trips would occur per day during Project-related activities.

Criteria air pollutant emissions were estimated for both erosion protection and vegetation maintenance activities. Average daily emissions are listed below in Table 5. Calculations are included in Appendix C. Overall, the Proposed Project is anticipated to generate emissions substantially below both daily and annual BAAQMD significance thresholds for all criteria air pollutants. As a result, the Proposed Project would not violate any air quality standards or plans. This is considered a less than significant impact and no mitigation is required.

Table 4. BAAQMD CEQA Thresholds of Significance for Criteria Air Pollutants

| Criteria Air Pollutants and Precursors (Regional) | Operational Thresholds | |
|--|--|--------------------------------|
| | Average Daily Emissions (lb/day) | Maximum Annual Emissions (tpy) |
| Reactive Organic Gases (ROG) | 54 | 10 |
| Nitrogen oxides (NOx) | 54 | 10 |
| Particulate Matter (PM ₁₀) | 82 | 15 |
| Particulate Matter (PM _{2.5}) | 54 | 10 |
| PM ₁₀ /PM _{2.5} (fugitive dust) | None | |
| Local Carbon Monoxide (CO) | 9.0 ppm (8-hour average), 20.0 ppm (1-hour average) | |
| Risk and Hazards for new sources and receptors (Individual Project) Note: <i>Threshold for new receptors is effective May 1, 2011.</i> | Compliance with Qualified Community Risk Reduction Plan OR <ul style="list-style-type: none"> • Increased cancer risk of >10.0 in a million • Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) • Ambient PM_{2.5} increase: > 0.3 µg/m³ annual average <u>Zone of Influence:</u> 1,000-foot radius from property line of source or receptor | |
| Risk and Hazards for new sources and receptors (Cumulative Threshold). Note: <i>Threshold for new receptors is effective May 1, 2011.</i> | Compliance with Qualified Community Risk Reduction Plan OR <ul style="list-style-type: none"> • Cancer risk: >100 million (from all local sources) • Non-cancer risk: > 10.0 Hazard Index (from all local sources, Chronic) • Ambient PM_{2.5}: > 0.8 µg/m³ annual average (from all local sources) <u>Zone of Influence:</u> 1,000-foot radius from property line of source or receptor | |
| Accidental Release of Acutely Hazardous Air Pollutants | Storage or use of acutely hazardous materials located near receptors or new receptors located near stored or used acutely hazardous materials considered significant | |
| Odors | Five confirmed complaints per year averaged over 3 years | |
| tpy – tons per year; lb/day – pounds per day; ppm – parts per million Source: BAAQMD 2011a | | |

Table 5. Project-related Emissions and Regulatory Thresholds

| | ROG ¹ | NOx ² | PM ₁₀ ³ | PM _{2.5} ³ |
|--|------------------|------------------|-------------------------------|--------------------------------|
| Project-related Daily Emissions | 0.30 | 7.65 | 0.24 | 0.17 |
| BAAQMD Daily Construction Emissions Thresholds | 54 | 54 | 82 | 54 |
| Threshold Exceeded? | No | No | No | No |

¹ROG: reactive organic gases

²NOx: nitrogen oxides

³PM: particulate matter

c. Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Project Region is a Nonattainment Area — *Less than Significant*

As determined above in Items *a* and *b*, the Proposed Project would not generate criteria air pollutant emissions in excess of BAAQMD significance thresholds. The BAAQMD significance thresholds utilized also represent cumulative thresholds. Therefore, the Proposed Project would not make a considerable contribution to cumulative impacts related to air quality. No mitigation is necessary.

d. Expose Sensitive Receptors to Substantial Pollutant Concentrations — *Less than Significant*

Examples of sensitive receptors within the Project Area that would be exposed to emissions of criteria air pollutants include schools, hospitals and residential areas. However, as determined above in Items *a*, *b* and *c*, the proposed maintenance activities would occur infrequently and would not generate emissions of criteria air pollutants in excess of BAAQMD significance thresholds. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations. This is considered a less than significant impact. No mitigation is necessary.

e. Create Objectionable Odors — *Less than Significant*

Superficial grading during erosion protection is the only proposed activity with the potential to generate objectionable odors. Exposed soils from stream channels may contain high levels of organic material or reduced sulfur, which could generate temporary and localized odors.

The BAAQMD indicates that odor impacts could result from siting a new odor source near existing sensitive receptors. As the Proposed Project’s erosion protection activities would be small and infrequent, the number of people exposed to odor from any event would be small and the duration of exposure would be temporary and short. Therefore, the Proposed Project is not considered to have the potential to generate substantial

annoyances from odors to sensitive receptors. This is considered a less than significant impact. No mitigation is necessary.

4.4 Biological Resources

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|---|--------------------------------|--|-------------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| 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 DFW or USFWS? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | 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 CDFW or USFWS? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including marshes, vernal pools, and coastal wetlands) through direct removal, filling, hydrological interruption, or other means? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

4.4 Biological Resources

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--|--------------------------------|--|------------------------------|-------------------------------------|
| f. Conflict with the provisions of an adopted habitat conservation plan (HCP); natural community conservation plan; or other approved local, regional, or state HCP? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a. Substantial Adverse Effect, Either Directly or Through Habitat Modifications, on Any Species Identified As A Candidate, Sensitive, or Special-Status Species — *Less than Significant*

The potential for special status species to occur in Project Area was evaluated according to the following criteria: No Potential, Low, Moderate, and High. Please see Appendix B, Tables B-1 and B-2 for species and details. A discussion of the Project's potential effects on special status species are provided below.

Potential Impacts to Special Status Plant Species

Maintenance of streamside vegetation and ground-disturbing activities, including bank stabilization, and debris and sediment removal, have the potential to destroy or otherwise harm special status plant species if they are present in work areas. Table B-1 in the Appendix B lists the special status plant species known to occur in the vicinity of the Project Area. The vast majority of plant species listed in Table B-1 are associated with habitats that would not be affected by Project activities including salt/brackish marsh, vernal pool, serpentine substrates, and several upland communities. Therefore, these species are considered to have no potential to occur in areas affected by Project activities. Plant species associated with valley grassland and wet meadow habitats are considered to have a low potential to occur in areas affected by Project activities. Plant species associated with freshwater marsh and riparian habitat are considered to have moderate to high potential to occur in areas affected by Project activities. Of the 44 special status plant species identified as potentially occurring in the project vicinity, 10 species have a low potential to occur in the Project Area and 4 species have a moderate potential. No sensitive plants were determined to have a high potential of occurrence in the Project Area.

The Proposed Project would avoid impacts to species (Table 2, BR-7). There would be pre-maintenance planning by a qualified botanist to special status plant identify maintenance sites with the potential to support special status plant species listed in Table B-1. This pre-maintenance planning includes targeted plant surveys, as needed, to ensure that species are not present in work areas. The Water Agency would not

conduct maintenance activities that would negatively impact a sensitive plant species. The Proposed Project would further minimize potential impacts to special status plant species and their habitats with BMP GEN-2 (Staging and Stockpiling of Materials), GEN-3 (Channel Access), BR-1 (Area of Disturbance), and BR-2 (Pre-Maintenance Educational Training). These actions would minimize disturbance of special status plants and their potential habitats during construction activities. The Proposed Project is not likely to result in a substantial adverse effect on any special status plant species or their habitat. Therefore, this impact would be less than significant and no mitigation is required.

Potential Impacts to Special Status Fish and Wildlife Species

Table B-2 in the Appendix B lists the special status fish and wildlife species known to occur in the vicinity of the Project Area. Most species listed in Table B-2 have no potential to be impacted by Project activities because the Project Area is not within the species current range or the species are associated with habitats (e.g., vernal pools, salt marsh) that would not be impacted by Project activities.

There are 30 special status fish and wildlife species identified as potentially occurring in the vicinity of the Project Area (Table B-2). Twenty species have a low to moderate potential to occur in the Project Area. There are five species with a high potential to occur in the Project Area, including California freshwater shrimp (*Syncaris pacifica*), Central California Coast steelhead (*Oncorhynchus mykiss*), western pond turtle (*Actinemys marmorata*), California red-legged frog (*Rana draytonii*), and foothill yellow-legged frog (*Rana boylei*). California freshwater shrimp are known from Sonoma Creek and low-gradient tributaries provide potential habitat. There are no California freshwater shrimp records from the Petaluma watershed, but potential habitat is present in low-gradient creek reaches. Steelhead have a broad distribution in the Project Area and may occur in perennial to semi-perennial creeks. California red-legged frogs have been reported from several sites on Sonoma Mountain, from both the Petaluma River and Sonoma Creek watersheds, and west of Petaluma. Slow-moving creek reaches and marsh habitats in the Project Area are potential habitat for the California red-legged frog. The foothill yellow-legged frog may occur in moderate-gradient creeks throughout the Project Area. Western pond turtle are likely broadly distributed throughout the low-gradient creeks in the Project Area.

The Proposed Project would avoid impacts to special status species. There would be pre-maintenance planning by a qualified biologist to identify sites with the potential to support sensitive species (Table 2, BR-4). This pre-maintenance planning would also include conducting site specific habitat assessments, as needed, to ensure that these species have no potential to occur in work areas. A maintenance activity would not be

implemented und the Proposed Project if a threatened or endangered species could be impacted.

Disturbance to nesting birds would be avoided by conducting maintenance outside of the nesting season or minimized by conducting nesting migratory bird and raptor pre-maintenance surveys (Table 2, BR-8). If nesting birds are found, a buffer will be established around the nest and maintained until the young have fledged or work postponed until a nest is no longer active.

Potential impacts to common fish and wildlife species would be minimized by relocating animals outside of the maintenance area to nearby suitable habitat (Table 2, BR-5).

Other Proposed Project actions that would avoid or minimize adverse impacts to biological resources from maintenance activities are as follows:

- BMP GEN-1: Work Windows; BR-2: Area of Disturbance, GEN-3: Channel Access, BR-1: Area of Disturbance, BR-2 Pre-Maintenance Educational Training, and BR-6: On-Call Wildlife Biologist. These actions would avoid and minimize disturbance to aquatic and riparian habitats.
- BMP HAZ-1: Spill Prevention and Response Plan and HAZ-4: Refueling. These actions would avoid and minimize the potential for degradation of habitat or direct impacts due to the accidental release of fuels and lubricants by preventing spills from occurring and quickly responding if a spill does occur.

The Proposed Project would prevent potential impacts to special status fish and wildlife species by avoiding occupied habitat and avoiding or sufficiently minimizing adverse impacts to potential habitat. Therefore, this impact would be less than significant and no mitigation is required. In addition, implementing maintenance activities such as bioengineered bank repairs and planting of riparian trees would likely result in beneficial effects to special status fish species and their habitat.

b. Have a Substantial Adverse Effect on Any Riparian Habitat or Other Sensitive Natural Community — Less than Significant

Project activities largely occur in sensitive natural communities including, riparian habitat, freshwater wetlands, and riverine aquatic habitat. Maintenance activities, including vegetation management, tree removal, debris removal, or bank stabilization, are likely to result in temporary impacts to sensitive natural communities. Permanent impacts (i.e., reduction in the extent or quality of a sensitive natural community) are not anticipated to occur.

The Proposed Project was designed to protect and minimize disturbance to sensitive natural communities as stated in Item a above. No mature and healthy riparian trees would be removed. The scope of the Proposed Project is restricted to small-scale

projects with a combined effect of no greater than 100 cy of excavated material and 3,000 linear feet of creek bank over a 5-year period. Also, maintenance activities consisting of bank stabilization and native plantings would enhance riparian habitat.

The Proposed Project would have a less than significant or potentially beneficial to sensitive natural communities, including riparian habitat.

c. Substantial Adverse Effects on Federally Protected Wetlands — *Less than Significant*

Project activities would largely avoid impacts to Section 404 CWA jurisdictional wetlands. However, maintenance activities, including debris removal and bank stabilization, may result in discharge of fill material. Discharge of fill would most commonly be associated with bank stabilization (e.g., bank recontouring) and would be implemented in concert with biotechnical stabilization approaches. These actions are implemented to control erosion that either threatens property or contributes fine sediment to aquatic habitat. The discharge of fill associated with bank stabilization would not result in loss of wetland area or conversion in type; some temporary loss of wetland functions may occur during the re-establishment of riparian vegetation.

Debris removal activities are undertaken to remove obstructions in streams and maintain flow. These activities would not result in loss of wetland area or conversion in type. These activities would generally improve water circulation and water quality. Some temporary loss of wetland functions may occur associated with loss of aquatic and wetland vegetation.

Proposed Project activities are not likely to result in the permanent reduction of wetland area, substantial conversion of wetland type, or a significant permanent decline in functions and values. Adverse effects are anticipated to be temporary and short-term (less than two years). Biotechnical bank stabilizations and riparian tree plantings implemented as part of the Proposed Project are likely to have a beneficial effect to Section 404 CWA jurisdictional wetlands. Therefore, this impact would be less than significant and no mitigation is required.

d. Substantial Interference With Wildlife Movement, Established Wildlife Corridors, or the Use of Native Wildlife Nursery Sites — *Less than Significant*

Maintenance activities including debris removal may affect the movement of fish species by altering flow paths or the distribution of stream substrate. Work in riparian areas, including vegetation maintenance, may temporarily alter dispersal corridors for native amphibians, reptiles, birds and mammals.

The Proposed Project would minimize adverse impacts to the movement of native fish and wildlife species (Table 2). These measures include:

- BMP GEN-1: Work Windows; BMP BR-2: Area of Disturbance, GEN-3: Channel Access, BMP BR-1: Area of Disturbance, BR-2 Pre-Maintenance Educational Training, and BR-6: On-Call Wildlife Biologist.

By implementing these BMPs, impacts to wildlife movement and migration would be avoided or sufficiently minimized such that adverse impacts are not likely to occur. Furthermore, individual maintenance activities are generally small-scale and would not result in creation of permanent barriers or obstructions to wildlife movement. Therefore, this impact would be less than significant and no mitigation is required.

**e. Conflicts With Local Policies or Ordinances Protecting Biological Resources
— No Impact**

Ordinance 6089 of the Sonoma County zoning code protects riparian corridors and functions along designated streams. Development setbacks of 50-200 feet are designated along most creeks and rivers in Zones 2A and 3A outside of city boundaries. Prohibited activities within setbacks include grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots. Allowable land use and activities are described in Sec. 26-65-040 of the ordinance including “stream maintenance and restoration carried out or overseen by the Sonoma County Water Agency.”

Article 67, Valley Oak Habitat Combining District, of the Sonoma County zoning code protects and enhances valley oaks and valley oak woodlands. This ordinance requires mitigation for the removal of large, 60-inch diameter, valley oak trees. However, exceptions include trees “dead or irretrievably damaged or destroyed by causes beyond the property owner’s control, including, without limitation, fire, flood, wind, lightning, or earth movement” (Section 26-67-030, item b). The Proposed Project would only affect downed or fallen trees and would not impact trees protected under this ordinance. Proposed maintenance activities would not significantly impact riparian resources or valley oak trees or conflict with local policies or protected by county ordinances.

f. Conflict With the Provisions of an Adopted HCP, Natural Community Conservation Plan — No Impact

There are no Habitat Conservation Plans or Natural Community Conservation Plans (NCCP) located within Zones 2A and 3A (USFWS 2015; CDFW 2015). Therefore, the proposed maintenance activities would not impact an HCP or NCCP and no mitigation is required.

4.5 Cultural Resources

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|---|--------------------------------|--|-------------------------------------|--------------------------|
| Would the Project: | | | | | |
| a. | Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the State CEQA Guidelines? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | Disturb any human remains, including those interred outside of formal cemeteries? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cultural and paleontological resources are protected by the National Historic Preservation Act, the California Environmental Quality Act, and the California Public Resources Code.

a,b,c,d. Adverse Change in Significance of Historical or Archaeological Resources — *Less than Significant*

There is some potential for maintenance activities to disturb previously unknown cultural resources. The Proposed Project would ensure that the locations of culturally sensitive areas are assessed during the early phases of project planning such that the appropriate actions to protect historical or archeological resources are implemented (Table 2, CR-1). Projects located in areas with sensitive resources that cannot be avoided would not be constructed.

As discussed in Chapter 2.2 Erosion Projection, maintenance activities would be located in areas already undergoing disturbance from streambank erosion. Only minor grading during maintenance at existing disturbed areas would be associated with installation of biotechnical repairs that will minimize the potential for accidental discovery of cultural resources. However, if previously undiscovered cultural resources are found during maintenance activities, the Proposed Project's BMP CR-2 *Previously Undiscovered Cultural Resources* and BMP CR-3 *Previously Undiscovered Paleontological Resources* will be employed to minimize and avoid resources, which may include not conducting the maintenance work (Table 2). Therefore, effects on historical or archaeological resources would be less than significant. No mitigation is necessary.

e. Adverse Change in Significance of a tribal cultural resource — *Less than Significant*

Assembly Bill 52 (AB 52) was signed by Governor Brown on September 25, 2014, and took effect on July 1, 2015, and creates a new category of environmental resources, "tribal cultural resources," to be considered under CEQA. Tribal cultural resources are defined in §21074 of the Public Resources Code as either:

- "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" that are included in the state register of historical resources or a local register of historical resources, or that are determined to be eligible for inclusion in the register; or
- Resources determined by the CEQA lead agency to be significant based on the criteria for listing in the state register. In applying these criteria the lead agency must consider the value of the resource to the tribe.

The legislation requires that lead agencies provide notice to tribes in the geographic area of a proposed project if they have requested to be notified. The tribe may request consultation within 30 days of receipt of the notice. This consultation may include the type of environmental review appropriate for the project, the significance of tribal cultural resources and associated impacts, alternatives and mitigation (State of California, 2014). The Water Agency has not received notice from tribes requesting consultation.

In addition, items a-d, above, describe actions to avoid and minimize impacts to cultural resources, including tribal cultural resources, to a less than significant level. No mitigation is required.

4.6 Geology, Soils, and Seismicity

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|--|--------------------------------|--|-------------------------------------|--------------------------|
| Would the Project: | | | | | |
| a. | Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| | 1. 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? Refer to Division of Mines and Geology Special Publication 42. | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | 2. Strong seismic ground shaking? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | 3. Seismic-related ground failure, including liquefaction? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | 4. Landslides? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Result in substantial soil erosion or the loss of topsoil? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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 an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

4.6 Geology, Soils, and Seismicity

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|---|--------------------------------|--|------------------------------|-------------------------------------|
| e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a, b, c, d. Exposure of People or Structures to Adverse Effects Associated with Seismic Activity, Landslide, Erosion, or Location on Unstable or Expansive Soils — *Less than Significant*

The Zones 2A and 3A Project Area could be subject to ground shaking as a result of earthquake activity on any of a number of faults in the region. Maximum ground accelerations and other earthquake induced hazards could be sufficient to damage the Project Area. The potential for liquefaction exists primarily in the wetland areas adjacent to San Pablo Bay and along the Petaluma River and Sonoma Creek, although most project creeks are located in the foothills (Figures 1 and 2). Also, expansive soils exist at a number of locations in Zones 2A and 3A. However, the Project does not propose to create any structures which would be permanently or temporarily occupied. The proposed maintenance activities (vegetation management, debris removal, minor bank stabilization, and habitat restoration) would not substantially affect, or be affected by, risks related to seismic events or other geologic hazards.

In the long-term, the proposed vegetation removal, revegetation, bank repair, and debris removal activities would have beneficial effects on potential erosion and sedimentation. Pruning and selective removal of downed trees on streambanks that have the potential to capture debris or redirect erosive flows toward the banks would tend to reduce erosion/sedimentation processes along streambanks. Similarly, the stabilization and treatment of streambanks that are actively eroding or slumping would tend to reduce the long-term erosion and sedimentation of an actively destabilized streambank. Therefore, this impact is less than significant and no mitigation is required.

e. Support of Septic Tanks or Alternative Wastewater Disposal Systems — *No Impact*

The Proposed Project would not result in the generation of wastewater, nor involve the construction or modification of any septic tanks or alternative wastewater disposal

systems. As such, the Proposed Project would have no impact associated with placement of such systems on unsuitable soils in the Project Area.

4.7 Greenhouse Gas Emissions

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|--|--------------------------------|--|-------------------------------------|--------------------------|
| Would the Project: | | | | | |
| a. | Generate a net increase in greenhouse gas emissions in excess of applicable thresholds adopted by the BAAQMD or the CARB which may have a significant impact on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Conflict with a county-adopted climate action plan or another applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a, b. Generation Of, Or Conflicts With, Plans Or Polices To Reduce Greenhouse Gas Emissions — *Less than Significant*

Anthropogenic emissions of greenhouse gases (GHG) are widely accepted in the scientific community as contributing to global climate change. Temperature increases associated with climate change are expected to negatively impact plant and animal species, cause ocean acidification and sea level rise, affect water supplies, impact agriculture, and harm public health. California has contributed to GHG emissions and was estimated in 2006 by the California Energy Commission to be responsible for approximately 2 percent of the world's total GHG emissions (California Climate Change Center 2006). California's total GHG emissions were estimated at 471 million metric tons of CO₂ equivalents in 2006 by California Air Resources Board (CARB) in its Greenhouse Gas Inventory Data (CARB 2010).

California has recently enacted a number of policies and plans to address GHG emissions and climate change. In 2006, AB 32, the Global Warming Solutions Act was passed, which set the overall goals for reducing California's GHG emissions. The goals are to reduce GHG emissions to 2000 GHG emission levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050 (CARB 2011).

The Bay Area Air Quality Management District (BAAQMD) CEQA Air Quality Guidelines include quantitative thresholds for evaluating GHG emissions from projects and plans

and guidelines for assessing these impacts. The thresholds, adopted in June 2010, include an emissions threshold of 1,100 metric tons (MT) of carbon dioxide equivalent (CO₂e) per year for projects that are not stationary sources. However, BAAQMD has not adopted thresholds of significance for construction-related GHG emissions. The BAAQMD recommends that agencies calculate the emissions and disclose that GHG emissions would occur during construction. The BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable.

As described in Table 6, the GHG emissions expected to result from the Proposed Project would be far below BAAQMD CEQA thresholds due to the small size of the project construction and infrequent annual activity. Calculations are included in Appendix C.

Table 6. Greenhouse Gas Emissions Anticipated to Result from the Proposed Project

| | | |
|----------------------------|--------------|------------------------------|
| PROJECT TOTAL | 12.33 | MT CO₂e/yr |
| BAAQMD Threshold | 1,100 | MT CO₂e/yr |
| Threshold Exceeded? | | No |

The Sonoma County Community Climate Action Plan, adopted in 2008, was prepared to identify potential solutions to help the nine cities in Sonoma County achieve GHG reduction goals. The plan established GHG reduction targets and goals for major sectors including commercial, residential, transportation, and land use planning. In response to the Climate Action Plan Solution, the Sonoma County Board of Supervisors adopted Resolution No. 10-0253 on March 20, 2010, to establish energy and sustainability standards for local agency construction projects, which is defined as a publicly owned, leased, or operated building. The resolution sets forth requirements to demonstrate and help achieve the County of Sonoma’s commitment to protect the climate, reduce pollution, conserve natural resources, promote sustainable practices, provided healthy work environments, reduce ongoing building operation costs, and provide environmental leadership. The Proposed Project would not include construction of any structures, including buildings.

Vehicles and heavy equipment associated with the Proposed Project’s activities emit GHGs. In addition, vegetation management has the secondary effect of altering the uptake and sequestration of greenhouse gases, and the decomposition of removed vegetation would release stored carbon to the atmosphere. These activities would represent a contribution to global climate change. However, part of the Proposed

Project consists of revegetation and tree planting, which serves as a carbon sink. In addition, bank stabilization activities prevent further loss of riparian vegetation that sequester carbon. Also, the Proposed Project's BMP BR-1 (*Area of Disturbance*), BMP VEG-1 (*Removal of Existing Vegetation*), BMP VEG-2 (*Planting and Revegetation After Soil Disturbance*) will minimize onsite disturbance to vegetation (Table 2). The Proposed Project's erosion protection and revegetation activities at least partially, if not fully, offset any contributions that the Project may have to global climate change. For these reasons, the contribution of GHG from the Proposed Project is considered less than significant and no mitigation is required.

4.8 Hazards and Hazardous Materials

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|---|--------------------------------|--|-------------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| a. | Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. | Be located within an airport land use plan area or, where such a plan has not been adopted, be within 2 miles of a public airport or public use airport and result in a safety hazard for people residing or working in the study area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f. | Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the study area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

4.8 Hazards and Hazardous Materials

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|----|--|--------------------------------|--|-------------------------------------|--------------------------|
| g. | Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| h. | Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a, b. Creation Of Hazard Through Transport, Use Or Disposal Of Hazardous Materials — *Less than Significant*

The Proposed Project's maintenance activities would involve the use of fuels and lubricants for equipment. If these materials were released into the water or ground during application or equipment refueling or maintenance, contamination and harm to people could result. These hazardous materials would be transported to and from the maintenance sites and would be removed once the project is complete. Hazardous materials would not be permanently stored at any of the maintenance sites. Also, creeks are common locations for illegal dumping of trash containing hazardous wastes, such as tires, oil filters, and paint cans. In addition, pollutants transported in stormwater runoff can accumulate in these water bodies. Hazardous waste deposited in stream channels would potentially be removed as part of proposed maintenance activities.

The Proposed Project would minimize or avoid the use or transport of hazardous materials by implementing several containment and preventative actions (Table 2, GEN-2, and HAZ-1 through -6). This impact is less than significant and no mitigation is required.

c. Generation of Hazardous Emissions/ Use of Hazardous Materials Within 0.25 Mile of Schools — *Less than Significant*

The Proposed Project would involve transport and use of small quantities of fuels, and lubricants, which may be hazardous. Additionally, stream channels may intersect with areas of existing soil or groundwater contamination.

There are 61 schools located within 0.25 mile of stream channels within Zones 2A and 3A (Table 3). Most of these schools are in session during a traditional school calendar,

and some are open year-round. Thus, children may be present when maintenance activities are implemented near schools and could potentially be exposed to hazardous materials from maintenance work sites.

The Proposed Project would restrict and contain the use of hazardous materials (Table 2, GEN-2, and HAZ-1 through -6). Therefore, impacts due to use or emissions of hazardous materials in close proximity to schools would be less than significant and no mitigation is required.

d. Location on Listed Toxic Site, and Related Impacts — *Less than Significant*

The potential to disturb existing contaminated sites in Sonoma County would be evaluated as part of the annual maintenance planning process (Table 2, HAZ-6). Upon selection of maintenance project locations, the Water Agency would conduct a search for existing known contaminated sites on the State Water Resource Control Board’s (SWRCB) GeoTracker database accessible online at: <http://geotracker.swrcb.ca.gov>. Proposed maintenance activities would avoid known contaminated sites or remediation

Table 3: Schools with 0.25 mile of the Zones 2A and 3A Natural Channels Maintenance Project Area.

| School Name | City/ Community | School Name | City/ Community |
|----------------------------------|--------------------|--------------------------------|--------------------|
| Zone 2A (Petaluma Valley) | | Zone 3A (Sonoma Valley) | |
| Building Blocks | Penngrove | El Nido School | Boyes Hot Springs |
| Penngrove Elementary | Penngrove | Dunbar Elementary | Glen Ellen |
| Redwood Montessori | Penngrove | Kenwood Elementary | Kenwood |
| Adobe Christian | Petaluma | Adele Harrison Middle | Sonoma |
| Casa Grande High | Petaluma | Altimira Middle | Sonoma |
| Childrens Haven | Petaluma | Archbishop Hanna High School | Sonoma |
| Cinnabar Elementary | Petaluma | Community School | Sonoma |
| Corona Creek Elementary | Petaluma | Crescent High School | Sonoma |
| Cypress Primary School | Petaluma | Crescent Montessori School | Sonoma |
| Cypress Secondary School | Petaluma | El Verano Elementary | Sonoma |
| Family Life Center | Petaluma | Flowery Elementary | Sonoma |
| Gateway to College Academy | Petaluma | Gateway | Sonoma |
| Grant Elementary | Petaluma | Gateway Middle | Sonoma |
| Halls of Learning | Petaluma | Montessori School Of Sonoma | Sonoma |
| Happy Day Presbyterian | Petaluma | New Song I.S.P. | Sonoma |
| Headwaters Academy | Petaluma | New Song School | Sonoma |
| Kenilworth Junior High | Petaluma | Presentation School | Sonoma |
| Kindercare | Petaluma | Prestwood Elementary | Sonoma |
| Learning To Learn | Petaluma | Sassarini Elementary | Sonoma |
| Little Scholar | Petaluma | Sonoma Charter | Sonoma |

| | | | |
|--|----------|--------------------------------|--------|
| Loma Vista Immersion Academy | Petaluma | Sonoma Valley Academy | Sonoma |
| McKinley Elementary | Petaluma | Sonoma Valley Adult | Sonoma |
| McNear Elementary | Petaluma | Sonoma Valley Christian School | Sonoma |
| Miwok Valley Elementary | Petaluma | Sonoma Valley High | Sonoma |
| Old Adobe Elementary | Petaluma | St Francis Solano | Sonoma |
| Pepper School | Petaluma | Sunshine School | Sonoma |
| Petaluma Charter | Petaluma | Woodland Star Charter | Sonoma |
| River Montessori Charter School | Petaluma | | |
| Sonoma Mountain Elementary | Petaluma | | |
| Sonoma Mountain High (Continuation) | Petaluma | | |
| Spring Hill Montessori - Elementary | Petaluma | | |
| Tiny Tots | Petaluma | | |
| Willow Tree | Petaluma | | |
| Wilson Elementary | Petaluma | | |

efforts by either relocating the project site or by not implementing the maintenance activity. Therefore, there would be no impact and no mitigation would be required.

e, f. Location in the Vicinity of A Public or Private Airstrip — No Impact

Public airports in the Project Area consist of Petaluma Municipal Airport, Sonoma Valley Airport, and Sonoma Skypark. Also, small private airstrips occur in the Project Area. Although proposed maintenance activities may be performed within two miles of an airport, these activities would not interfere with airport operations, would not involve the use of any equipment that would affect aircraft utilizing any airports in Sonoma County, and would not result in a substantial safety hazard to people residing or working in vicinity of airports. Therefore, there would be no impact and no mitigation is required.

g. Interference with Emergency Response or Evacuation Plan — Less than Significant

During maintenance activities, infrequent road closures may be necessary. If road closures or traffic generated by maintenance activities (such as hauling of disposal materials) were to interfere with emergency response measures such that response times were extended, a significant impact would result. However, the Proposed Project would ensure that temporary lane closures are avoided or minimized and coordinated with local emergency response agencies to plan for alternative access routes (Table 2, GN-4), and that haul routes consider level of service (LOS) and existing traffic (see Section 4.16 Traffic and Transportation). The Proposed Project would have a less-than-significant impact on emergency response or evacuations. No mitigation is required.

h. Exposure of People or Structures to Risk of Wildland Fires — *Less than Significant*

Proposed maintenance activities would not involve placement of people or habitable structures in areas without adequate fire protection. Additionally, proposed maintenance activities would not result in the creation of new wildland areas which could increase fire dangers. In the long term, management of riparian vegetation would reduce the risk of wildfires.

However, because maintenance activities would be conducted during the dry summer months when fire danger is the highest there is a potential for an accidental ignition of a wildland fire. The Proposed Project would include fire prevention, which requires on-site fire suppression equipment, spark arrestors on all equipment with internal combustion engines, and restricts activities on high fire danger days to reduce the risk of fire (Table 2, HAZ-7). Therefore, this impact would be less than significant, and no mitigation is necessary.

4.9 Hydrology and Water Quality

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|--|--------------------------------|--|-------------------------------------|--------------------------|
| Would the Project: | | | | | |
| a. | Violate any water quality standards or waste discharge requirements? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

4.9 Hydrology and Water Quality

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|----|--|--------------------------------|--|-------------------------------------|-------------------------------------|
| f. | Otherwise substantially degrade water quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| g. | Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| h. | Place within a 100-year flood hazard area structures that would impede or redirect floodflows? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| i. | Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| j. | Contribute to inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a, c, f. Violation of Water Quality Standards or Waste Discharge Requirements, Erosion and Siltation Impacts Related to Alteration in Existing Drainage Patterns, Other Degradation of Water Quality — *Less than Significant*

The Proposed Project would prevent or minimize accidental releases of sediment and contaminants during ground disturbance, such as erosion protection maintenance activities, that could impact water quality (Table 2, VEG-2, WQ-1, and HAZ 1- 6). No violation of water quality standards or waste discharge requirements is anticipated. Also, it is anticipated that erosion protection activities will have a long-term beneficial effect on hydrology and water quality. Impacts are considered less than significant and no mitigation is required.

b. Effects on Groundwater Supply or Recharge — *Less than Significant*

Proposed maintenance activities would not affect existing groundwater wells and pumping facilities, and no new wells or pumps would be installed as part of the project.

The proposed maintenance activities would not involve any actions that would substantially deplete groundwater supplies or affect the aquifer volume or groundwater table level.

d, e, g, h, i. Runoff and Flooding Impacts Related to Alteration in Existing Drainage Patterns, Effects on Capacity of Existing or Planned Stormwater Drainage Systems, Potential to Increase Flooding Hazards — *Less than Significant*

Maintenance activities associated with stormwater systems would include small-scale vegetation management, debris removal, and erosion protection that function to maintain the stormwater system. Maintenance activities would not alter the rate or timing of stormwater runoff, or otherwise result in decreases in the capacity of existing stormwater drainage systems in Zones 2A and 3A. Overall, the effects of the Proposed Project maintenance activities would reduce the risk of flooding and may benefit stormwater drainage systems. No mitigation is required.

j. Potential to Contribute to Seiche, Tsunami, and Mudflow Hazards — *No Impact*

The southern portions of Zones 2A and 3A are tidally influenced by San Pablo Bay and the larger San Francisco Bay. Consequently, effects of seiche or tsunami events would potentially influence stream channels within the Project Area. However, stream maintenance activities would not increase the risks posed by these events. Instead, stream maintenance activities at selected channels would remove blockages that could cause flooding, both from downstream flowing waters and upstream flowing waters occurring under seiche or tsunami events. Proposed maintenance activities would beneficially protect against impacts from seiche or tsunami.

The Project Area includes creeks adjacent to hillslope areas that may be prone to mudflows. However, maintenance activities would not increase the potential for mudflows to occur. On the contrary, maintenance activities are implemented to prevent against occurrences of bank failures and mudflows, and the resulting sedimentation and degradation of water quality. Therefore, no impact related to increase of mudflow risks is anticipated. No mitigation is required.

4.10 Land Use and Planning

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|--|--------------------------------|--|------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| a. | Physically divide an established community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Conflict with any applicable habitat conservation plan or natural community conservation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a. Divide an Established Community — *No Impact*

The Proposed Project would consist of short-term small-scale maintenance activities that are restricted to channel areas. These activities would not permanently affect access to any of the surrounding land uses, nor create any new permanent, physical barriers between developed areas. Therefore, the Proposed Project would not divide an existing community.

b. Conflicts with Land Use Plans or Policies — *No Impact*

The Proposed Project activities would not result in new development and land would not be altered from its present use. Although temporary impacts are associated with the Proposed Project, maintenance activities would improve the quality and condition of habitat along project creeks. Over the long-term, implementation of the Proposed Project would protect existing development and land uses by maintaining water conveyance capacity and providing enhanced riparian and instream habitat in the Project Area. Achieving these objectives would support existing land use plans and would not result in incompatibilities with existing and adjacent land uses. The Proposed project would not impact any land use plan and no mitigation is required.

c. Conflicts with Habitat Conservation Plans — *No Impact*

The Proposed Project activities would not occur within the boundaries of any existing or proposed habitat conservation plans. Therefore, there would be no impact related to conflict with an adopted or proposed conservation plan. No mitigation is required.

4.11 Mineral Resources

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|---|--------------------------------|--|------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a, b. Loss of Availability of Mineral Resources — *No Impact*

There are no instream mining or mineral resource areas in creeks in Zones 2A and 3A. The Proposed Project would not involve any activities that could directly affect mineral production sites. There would be no impact. No mitigation is required.

4.12 Noise

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|------------------------------|--|--------------------------------|--|-------------------------------------|-------------------------------------|
| Would the Project result in: | | | | | |
| a. | Exposure of persons to or generation of noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | For a project located within an airport land use plan area, or, where such a plan has not been adopted, within 2 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| f. | For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a. Exposure to Noise Levels in Excess of Local or County Standards — *Less than Significant*

There is currently no Sonoma County noise ordinance. The Sonoma County General Plan 2020 (PRMD 2008) contains the following: Policy NE-1i: County equipment and vehicles shall comply with adopted noise level performance standards consistent with the best available noise reduction technology. Also, the General Plan provides guidance for reviewing new permanent projects and new transportation projects, but does not address temporary construction noise.

The two cities in the Project Area have noise ordinances. The City of Petaluma Noise Ordinance limits construction-related noise to between 7:00 a.m. and 10:00 p.m. on Monday through Friday. The City of Sonoma City Code places limits on noise levels between 8:00 a.m. and 6:00 p.m. on week days. The noise level at any point outside of the property plane of the project shall not exceed 90 dBA.

The Proposed Project would implement maintenance activities using hand tools to the greatest extent feasible. On occasion heavy equipment may be needed for erosion protection and debris removal activities, though use would be temporary and localized. The number and type of heavy equipment needed for a particular activity will vary depending on site conditions and project needs. Typical heavy equipment and noise levels at 50 feet is an excavator with a noise level of 85 dBA (A-weighted decibel, a measurement of sound), dump truck at 84 dBA, and grader at 85 dBA (USDOT 2006). For reference a power lawnmower has a noise level of 90 dBA.

Noise from the Proposed Project would be minimized by the small scale of maintenance activities that would typically not exceed more than three days at any one location. Maintenance scheduling would restrict noise to weekday business hours (Table 2, GN-2). Construction noise would not exceed local city ordinances and comply with county policy. Therefore, there would be a less than significant impact. No mitigation is required.

b. Exposure to Excessive Groundborne Vibration or Noise — *No Impact*

Activities under the Proposed Project would not include impact construction (i.e. pile driving or other equipment) which produce ground-borne vibrations. Therefore, there would be no impact and no mitigation is required.

c. Permanent Substantial Increase in Ambient Noise Levels — *No Impact*

The Proposed Project's maintenance activities would be temporary, and would not involve or create any permanent noise sources. There would be no permanent increase in ambient noise levels as a result of implementation of the Proposed Project. There would be no impact and no mitigation is required.

d. Substantial Temporary Increases in Ambient Noise Levels — *Less than Significant*

Maintenance activities proposed would result in temporary increases in noise as discussed above in Item A. However, as described, noise from maintenance activities would be short-term, intermittent, and would not occur during the evening hours, on weekends, or on holidays. As such, this impact would be less than significant and no mitigation is required.

e-f. Exposure to Excessive Noise Levels in an Airstrip or Airport Land Use Area — *Less than Significant*

Maintenance activities may occur in creeks located within an airport land use area or the vicinity of a private airstrip. However, the duration of project activities would be short-term (typically three days or less) and would not require the permanent or long-term stationing of personnel or residences in these locations. This is a less than significant impact and no mitigation is required.

4.13 Population and Housing

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|--|--------------------------------|--|------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| a. | Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Displace a substantial number of people, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a. Induce Population Growth — *No Impact*

The Proposed Project would not involve new development or infrastructure installation that could directly or indirectly induce population growth in the area, nor would the Proposed Project create the demand for additional housing. As such, the Proposed Project would have no impact on population growth and no mitigation is necessary.

b, c. Displace Population or Housing — *No Impact*

The Proposed Project would consist of small-scale maintenance activities and not involve the construction or development of additional infrastructure. As such, the Proposed Project would not displace any existing housing units or persons. There would be no impact and no mitigation is necessary.

4.14 Public Services

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--|--------------------------------|--|-------------------------------------|-------------------------------------|
| Would the Project: | | | | |
| a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a 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 following public services: | | | | |
| Fire protection? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Police protection? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Schools? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Parks? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Other public facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a1. Effects on Fire, Police, and Emergency Services — *Less than Significant*

The Proposed Project would not increase the population in the Project Area nor would it alter the existing population distribution temporarily or permanently. As such, the Proposed Project would not increase demand for fire, police, or emergency services as a result of population growth. However, maintenance activities may periodically require temporary road closures or detours in the vicinity of a work site. To the extent feasible, two-way traffic flow on all roadways will be maintained and complete road closures are not anticipated during maintenance activities. The Water Agency would coordinate with the appropriate local emergency service providers, as needed, to ensure that emergency vehicle response is not impeded (Table 2, GN-4). Further details of traffic effects during construction can be found in Section 4.16 Transportation and Traffic.

The Proposed Project's effect on police, fire, and emergency services response times and access would be minimal during maintenance. This impact is less than significant and no mitigation is required.

a2. Other Services or Facilities — *No Impact*

The Proposed Project is not anticipated to impact schools, parks, or other public facilities. Maintenance activities would be short in duration and small in scale. These maintenance activities directly reduce the flood hazard which, if not maintained, could negatively affect the operation of public facilities. Therefore, the Proposed Project would have no impact on these resources and may have beneficial effects from flood control maintenance activities. No mitigation is required.

4.15 Recreation

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|---------------------------|---|--------------------------------|--|------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

a. Increase Use of Existing Parks or Recreational Facilities — *No Impact*

As noted in Section 4.13 Population and Housing, the Proposed Project would not result in population growth. As such, the Proposed Project would have no impact on recreational demand related to population growth. No mitigation is required.

b. Creation of New or Altered Recreational Facilities — *Less than Significant*

The Proposed Project would not create any new recreational facilities. Also, maintenance activities would be conducted mainly on private property that are not open to the public for recreation. Thus, there are no potential effects on recreational facilities, and no mitigation is required.

4.16 Transportation and Traffic

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than- Significant Impact | No Impact |
|---------------------------|--|--------------------------------------|---|-------------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| a. | Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system and/or conflict with General Plan Policy CIR-16 which seeks to maintain an adequate Level of Service (LOS) at signalized and unsignalized intersections, or reduce the effectiveness of existing transit services or pedestrian/bicycle facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the Napa County Transportation and Planning Agency for designated roads or highways? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. | Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | Result in inadequate emergency access? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

4.16 Transportation and Traffic

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--|--------------------------------|--|-------------------------------------|--------------------------|
| f. Conflict with General Plan Policy CIR-23 which requires new uses to meet their anticipated parking demand, but to avoid providing excess parking which could stimulate unnecessary vehicle trips or activity exceeding the site's capacity? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| g. Conflict with adopted policies, plans, or programs supporting alternative transportation or otherwise decrease the performance or safety of such facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a, b. Substantial Increase in Traffic — *Less than Significant*

The Proposed Project's effect on traffic in the Project Area would be limited to short-term effects in any given location associated with maintenance vehicles and haul trips. Maintenance-related traffic would consist primarily of commutes to and from worksites by maintenance workers and periodic delivery and removal of materials during the maintenance period. The number of maintenance workers and vehicles would vary by project, phase, planned activity, and material needs. A typical maintenance activity may consist of a heavy equipment vehicle transported on a truck, dump truck, and one or two vehicles to transport staff and materials. Maintenance activities would primarily occur outside of roadways, usually on private property. However, construction vehicles accessing the site would contribute to traffic in the vicinity of a site.

Though anticipated to be uncommon, maintenance activities could include the physical encroachment into a roadway. Where insufficient widths for both maintenance vehicles and regular traffic occur, temporary closing or narrowing of lanes may be necessary to conduct maintenance activities, such as large debris removal at a bridge or culvert.

The Proposed Project would minimize temporary disturbance to traffic and maintain two-way traffic on public roadways to the extent feasible (Table 2, GN-4). If lane closures or traffic delays cannot be avoided, advance notice of road closures would be given to the appropriate jurisdictions and emergency service providers, and adequate warning and detour signs and flaggers will also be provided to safely guide travelers during maintenance activities (see Section 4.14, Item a1). The Proposed Project's

temporary effects on local traffic conditions would be less than significant and no mitigation is necessary.

c. Change in Air Traffic Patterns — *No Impact*

The Proposed Project does not include any features or actions that are related to airports or air traffic. There would be no impact on air traffic or airport service, and no mitigation is required.

d. Increased Hazards Due to Design Features — *Less than Significant*

The Proposed Project does not propose any changes that would permanently reconfigure or alter roadways in the Project Area. Please see Item a and b, above, for a discussion of temporary lane closures and delays. The Proposed Project would not result in a permanent adverse impact on roadway safety conditions. The Project's temporary effect on traffic safety hazards would be less than significant and no mitigation is required.

e. Inadequate Emergency Access — *Less than Significant*

The Proposed Project does not propose any structures that would permanently block or constrain roadways, and would therefore not result in a permanent impact on emergency access. The Project's impact on emergency access would be less than significant. No mitigation is required. Please Items a and b, above, for a discussion of road access during construction.

f. Inadequate Parking Capacity — *Less than Significant*

The Proposed Project would not generate permanent parking demand, and the activities proposed would not provide permanent parking. Maintenance activities would require temporary parking for maintenance workers. In general, project parking would occur on privately owned land. For parking which is not able to be kept within these locations, adequate parking or designated public parking would be provided to accommodate work staging and worker vehicle parking. The amount of parking required would be small in these cases, and would not be expected to substantially reduce the available parking supply in any given area. Consequently, impacts related to parking would be less than significant. No mitigation is required.

g. Conflict with Alternative Transportation Policies — *Less than Significant*

The Proposed Project would not result in permanent effects on public transit, bicycle, or pedestrian traffic. As previously described, the majority of maintenance activities would occur on private land where public access is not permitted. However, temporary maintenance activities occurring within public streets could disrupt transit operations, as well as pedestrian and bicycle access to transit stops, general access along designated bike routes and trails, and sidewalk-based pedestrian access.

If road or lane closures are required, bus routes would be maintained to the extent practicable. If transit routes need to be temporarily detoured, affected transit authorities will be notified and consulted (Table 2, GN-4). Similarly, closures of bike and pedestrian facilities, if required, would be scheduled outside of peak traffic hours to minimize conflicts. These standard considerations would also extend to closures of trails and access roads, not normally used by through vehicular traffic. Consultation with transit providers will ensure that effects on transit systems would be accounted for and that service would not be significantly disrupted. Therefore, the Project's temporary impacts on alternative transportation would be less than significant. No mitigation is required.

4.17 Utilities and Service Systems

| | | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|--------------------|---|--------------------------------|--|-------------------------------------|-------------------------------------|
| Would the Project: | | | | | |
| a. | Exceed wastewater treatment requirements of the applicable RWQCB? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Require or result in the construction of new water or wastewater treatment facilities or an expansion of existing facilities, the construction of which could cause significant environmental effects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Require or result in the construction of new stormwater drainage facilities or an expansion of existing facilities, the construction of which could cause significant environmental effects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Have sufficient water supplies available to serve the Project from existing entitlements and resources, or would new or expanded entitlements be needed? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. | Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f. | Be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| g. | Comply with federal, state, and local statutes and regulations related to solid waste? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a-c, e. Wastewater and Stormwater Generation or Treatment — *No Impact*

The Proposed Project is entirely focused on flood maintenance activities, and does not include any uses, features, or facilities that would generate wastewater. Furthermore, the Proposed Project would not increase or alter the distribution of the population in the Project Area as to alter the need or demand for wastewater treatment (see also Section 3.13 *Population and Housing*). Consequently, there would be no impact related to wastewater facilities and no mitigation is required.

Similarly, the Proposed Project would not expand the capacity of any existing stormwater drainage facility. The Proposed Project would maintain flood conveyance in creeks. Erosion protection activities would stabilize creek banks with the objective of returning creeks to their pre-existing condition. As such, there would be no impact associated with stormwater generation or treatment facilities and no mitigation is required.

d. Potable Water Supply — *Less than Significant*

Potential activities that may require water, include spraying for dust control and irrigation of revegetated sites. As described in Table 2, HAZ-3, on-site vehicle cleaning may occur, but only as needed to prevent the spread of sediment, pathogens, or exotic/invasive species. In addition, as detailed in AQ-1, active maintenance areas would be watered following required dust control measures set by the Bay Area Air Quality Management District.

Revegetation may be performed as part of bank stabilization and habitat protection and enhancement activities. Newly planted vegetation may require irrigation until the plants become established. The amount of water needed for irrigation would vary based on the specific vegetation types and quantities to be planted at each site. However, the post-bank repair revegetation would include considerations to ensure that plantings are appropriate to the site conditions to minimize irrigation needs and ensure long-term success. Successful establishment of vegetation would not require long-term water supplements. Furthermore, the Proposed Project would not require the construction of any long-term water distribution or supply facilities. Thus, this impact would be less than significant and no mitigation would be required.

f, g. Solid Waste Disposal — *Less than Significant*

The proposed maintenance activities would generate small amounts of debris for disposal annually. Soil excavated during erosion protection activities is anticipated to be reused onsite as part of bank stabilization. If needed, solid waste would be disposed of at the Sonoma County Central Landfill, which has the capacity to accommodate the disposal requirements of the Proposed Project's activities. Disposal at this facility is compliant with federal, state, and local regulations. Thus, this impact is less than significant. No mitigation is required.

4.18 Mandatory Findings of Significance

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less-than-Significant Impact | No Impact |
|---|--------------------------------|--|-------------------------------------|--------------------------|
| a. Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Does the Project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.) | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. Does the Project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

a. Effects on Environmental Quality, Fish or Wildlife, and Historic Resources — *Less than Significant*

Please refer to the impact discussions presented in Sections 3.1 through 3.17, in particular the impact analysis for Biological Resources and Cultural Resources. The project would not have potential for significant impacts related to any of the factors

described in the checklist question above. Impacts would be less than significant and no mitigation is required.

b. Cumulative Impacts — Refer to discussion of specific impacts below for significance conclusions

A cumulative impact refers to the combined effect of “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (State CEQA Guidelines Section 15355). As defined by the State of California, cumulative impacts reflect “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (State CEQA Guidelines Section 15355[b]).

The Water Agency’s Stream Maintenance Program (SMP) maintains engineered, modified, and natural streams primarily in urban areas of Zones 2A and 3A. The Proposed Project is similar to the SMP but is smaller in scope and would occur on natural channel easements in streams outside of the SMP project area. Although the Proposed Project may have less than significant temporary impacts during construction maintenance, in the long-term the project would have beneficial impacts on aesthetics, air quality, biological resources, soils, and hydrology and water quality.

5.0 References

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APPENDICES

Appendix A: Annual Report Outlines

Appendix B: Special Status Species

Table A-1. Special status plant species with potential to occur in Zones 2A and 3A

Table A-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

Appendix C: Air Quality and Green House Gas Emission Calculations

Appendix A: Annual Report Outlines

Annual Project Work Plan Notification (Outline)

1. Project List and Location
2. Site Specific Designs
 - A. Erosion Protection Projects
 - B. Vegetation Management Activities
3. Summary of Maintenance Project Sizes, Extents, and Potential Effects

Appendix A. Site Specific Photos

Appendix B. Project Designs

Appendix C. Project Maps with CNDDDB Overlay

Appendix D. Sensitive Species Habitat Evaluation and Survey Findings

Annual Post-Maintenance Summary Report (Outline)

1. Maintenance Work
 - A. Summary of Project Activities
 - B. Cumulative Activities (compare annual activities with regulatory restrictions)
2. Confirmation of Avoidance, Minimization, and Best Management Measures
3. Recommended Program Revisions or Updates
4. Anticipated Future Maintenance Activities

Appendix A. Maintenance Location Maps

Appendix B. Project Photo Sheets

Appendix B: Special Status Species

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|---|--|---|--|
| FEDERAL/STATE ENDANGERED OR THREATENED AND CALIFORNIA RARE SPECIES | | | | | |
| <i>Alopecurus aequalis</i> var. <i>sonomensis</i> Sonoma Alopecurus | FE 1B.1 | Occurs in freshwater marshes and swamps and riparian scrub. | May-July perennial herb | Possible habitat in the Project Area. One CNDDDB record from Ledson Marsh, recorded as recently as 2001. | Moderate |
| <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i> Baker's manzanita | SR 1B.1 | Occurs in broad-leafed upland forest and chaparral often on serpentine soils. | February-April perennial evergreen shrub | Upland species. No suitable habitat within the Project Area. No CNDDDB occurrences from the Project Area. | No Potential |
| <i>Blennosperma bakeri</i> Sonoma sunshine | FE SE 1B.1 | Occurs in mesic valley and foothill grassland and vernal pools. | March-May annual herb | Largely vernal pool species Marginal habitat within Project Area. Five CNDDDB occurrences at vernal pools in the project vicinity including Sonoma Valley Regional Park, near Laguna de Santa Rosa, Horn Ave Mitigation Bank, Bouverie Preserve east on Hwy 12, and the Haroutunian property at Hwy 101. | Low |
| <i>Ceanothus masonii</i> Mason's ceanothus | SR 1B.2 | Found in rocky serpentine ridges or slopes in chaparral or transition areas. | March-April perennial evergreen shrub | Upland species. No suitable habitat within the Project Area. No CNDDDB occurrences from the Project Area. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|--|--------------------------------------|---|--|
| <i>Chorizanthe valida</i> Sonoma spineflower | FE SE 1B.1 | Occurs in sandy coastal prairie. Closely related to <i>C. pungens</i> . | June-August annual herb | Upland species. No suitable habitat within the Project Area. One historical CNDDDB reported from Petaluma believed to be extirpated. Only extant occurrence was rediscovered in 1980 at Pt. Reyes in Marin County. | No Potential |
| <i>Chloropyron molle</i> ssp. <i>molle</i> soft bird's beak | FE SR 1B.2 | Occurs in coastal salt marshes and swamps. | July-November annual herb | Salt marsh species. No suitable habitat within the Project Area. Two CNDDDB occurrences recorded from Petaluma Mash near San Antonia Creek, not seen since 1978. Presumed extirpated from Sonoma County. | No Potential |
| <i>Delphinium bakeri</i> Baker's larkspur | FE SE 1B.1 | Occurs often on mesic sites and decomposed shale in broadleaved upland forest, coastal scrub, and valley and foothill grassland. | March-May perennial herb | Upland species. No suitable habitat within the Project Area. No CNDDDB occurrences reported with the Project Area. | No Potential |
| <i>Delphinium luteum</i> yellow larkspur (also golden larkspur) | FE SR 1B.1 | Occurs on rocky sites in chaparral, coastal prairie, and coastal scrub on north-facing rocky slopes. This taxon hybridizes with <i>D. nudicaule</i> . | March-May perennial herb | Upland species. No suitable habitat within the Project Area. One CNDDDB occurrence reported in project vicinity west of Petaluma. | No Potential |
| <i>Hesperolinon congestum</i> Marin western flax | FT ST 1B.1 | Occurs in chaparral, valley and foothill grassland and in serpentine barrens and serpentine grassland and chaparral. | April-July annual herb | Upland serpentine species. No suitable habitat within the Project Area. Three CNDDDB occurrences reported in the project vicinity, all from Mt. Burdell Open Space. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--|--|--|--|--|
| <i>Lasthenia burkei</i> Burke's goldfields | FE SE 1B.1 | Occurs in mesic meadows and seeps and vernal pools. | April-June annual herb | Largely vernal pool species. Marginal habitat within Project Area. Three CNDDDB occurrences reported in project vicinity one just north of Laguna de Santa Rosa and two others in Horn mitigation bank south of Santa Rosa. | Low |
| <i>Lasthenia conjugens</i> Contra Costa goldfields | FE 1B.1 | Occurs on mesic sites in cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools. | March-June annual herb | Largely vernal pool species. Marginal habitat within Project Area. One CNDDDB occurrence in project vicinity recorded west of Stage Gulch Rd. near Petaluma Road, east of Petaluma. | Low |
| <i>Lilium pardalinum</i> ssp. <i>pitkinense</i> Pitkin Marsh lily | FE SE 1B.1 | Occurs on mesic and sandy sites in cismontane woodland, meadows and seeps, and freshwater marshes and swamps. | June-July perennial bulbiferous herb | This species is highly restricted to Pitkin and Cunningham marshes. One CNDDDB report from 1880 from Petaluma, possibly extirpated. | Low |
| <i>Limnanthes vinculans</i> Sebastopol meadowfoam | FE SE 1B.1 | Occurs on vernal mesic sites in meadows and seeps, valley and foothill grassland, and vernal pools. Prefers wet and marshy areas in Valley Oak savanna on poorly drained soils of clays and sandy loam. | April-May annual herb | Largely vernal pool species. Marginal habitat within Project Area. Six CNDDDB occurrences in the vicinity of the Project Area in Santa Rosa and Rohnert Park, including two in the Horn mitigation bank. | Low |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|---|---|--|--|
| <i>Pleuropogon hooverianus</i> North Coast semaphore grass | -- ST 1B.1 | Occurs in open and mesic areas in broad-leaved upland forest, meadows and seeps, and North Coast coniferous forest. Prefers wet, grassy, shady areas, sometimes freshwater marshes. | April-June perennial rhizomatous herb | Marginal habitat within Project Area. One CNDDDB recorded from uplands along Pressley Road east of Cotati. | Low |
| <i>Sidalcea oregana</i> ssp. <i>valida</i> Kenwood Marsh checkerbloom | FE SE 1B.1 | Occurs along edges of freshwater marshes and swamps. | June-September perennial rhizomatous herb | Marginal habitat within Project Area. One CNDDDB occurrence from Kenwood Marsh. | Low |
| <i>Trifolium amoenum</i> two-fork (showy rancheria) clover | FE 1B.1 | Occurs in coastal bluff scrub and valley and foothill grassland that can be serpentic. Rediscovered in 1993. | April-June annual herb | Upland species. No suitable habitat in Project Area. Species only currently extant in Marin County. Historically CNDDDB occurrences recorded from Point Reyes Road, Stony Point, and around Kenwood. | No Potential |
| CALIFORNIA NATIVE PLANT SOCIETY LISTED AND LOCALLY RARE SPECIES | | | | | |
| <i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion | 1B.2 | Occurs on clay in cismontane woodland and valley and foothill grassland often on serpentic sites. | May-June perennial herb (bulbiferous) | Upland serpentine species. No suitable habitat in Project Area. Three CNDDDB occurrences in the project vicinity from Petaluma, Hope Valley in Kenwood and Sonoma. | No Potential |
| <i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo | 1B.2 | Occurs in openings in broadleaved upland forest, chaparral, and cismontane woodland. | April-July perennial deciduous shrub | Upland species. No suitable habitat in Project Area. Eleven CNDDDB occurrences in project vicinity. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|--|---------------------------------------|--|--|
| <i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> Rincon Ridge manzanita | 1B.1 | Rhyolitic chaparral and cismontane woodland between 75-370 meters. | February-April shrub (evergreen) | Upland species. No suitable habitat in Project Area. One CNDDDB recorded from Buzzard Peak near quarry northwest of Kenwood. | No Potential |
| <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> big-scale balsamroot | 1B.2 | Chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentine soils. | March-June perennial herb | Upland species. No suitable habitat in Project Area. One CNDDDB occurrence reported near Sonoma. | No Potential |
| <i>Brodiaea californica</i> var. <i>leptandra</i> narrow-anthered California brodiaea | 1B.2 | Occurs in broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland with volcanic soils. | May-July perennial herb (bulbiferous) | Upland species. No suitable habitat in Project Area. Six CNDDDB occurrences reported from the Sonoma and Kenwood quads. | No Potential |
| <i>California macrophylla</i> round-leaved filaree | 1B.1 | Occurs in cismontane woodland, valley and foothill grassland on clay soils. | March-May annual Herb | Upland species. No suitable habitat in Project Area. CNDDDB occurrence in Sonoma County is from a location where natural habitat is presumed to no longer exist. | No Potential |
| <i>Ceanothus confusus</i> Rincon Ridge ceanothus | 1B.1 | Closed-cone coniferous forest, chaparral, cismontane woodland on volcanic or serpentic substrates. Closely related to <i>C. prostratus</i> . | February-April shrub (evergreen) | Upland serpentine species. No suitable habitat in Project Area. Six CNDDDB occurrences from Sonoma and Kenwood area with elevation greater than 900 feet on slopes and ridgelines. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|--|--|--|--|
| <i>Ceanothus divergens</i> Calistoga ceanothus | 1B.2 | Found in rocky, serpentine or volcanic chaparral. Closely related to <i>C. purpureus</i> . | February-March shrub (evergreen) | Upland serpentine species. No suitable habitat in Project Area. Seven CNDDDB occurrences in project vicinity including, but not limited to, Annadel and Sugarloaf Ridge State Parks, and Buzzard Peak. | No Potential |
| <i>Ceanothus purpureus</i> holly-leaved ceanothus | 1B.2 | Occurs in chaparral and cismontane woodland on volcanic and rocky substrates. | February-June shrub (evergreen) | Upland species. No suitable habitat in Project Area. One CNDDDB occurrence reported from northwest of Kenwood from 1936. | No Potential |
| <i>Ceanothus sonomensis</i> Sonoma ceanothus | 1B.2 | Occurs in chaparral on sandy, serpentinic, or volcanic substrates. | February-April shrub (evergreen) | Upland serpentine species. No suitable habitat in Project Area. One CNDDDB occurrence reported from Bismark Knob in Devils Canyon from 1980. | No Potential |
| <i>Centromadia parryi</i> ssp. <i>parryi</i> Pappose tarplant | 1B.2 | Occurs in coastal prairie, meadows and seeps, coastal salt marshes, and valley and foothill grassland, often in vernally mesic, alkaline sites. | May-November annual herb | Marginally suitable habitat within Project Area. One CNDDDB occurrence in 1987 at Willow Brook north of Petaluma. | Moderate |
| Chloropyron maritimus ssp. palustris Point Reyes salty bird's-beak | 1B.2 | Coastal salt marshes and swamps. Once common in proper habitat. | June-October annual herb (hemiparasitic) | Salt marsh species. No suitable habitat in Project Area. One CNDDDB occurrence reported from the Petaluma Marsh. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|--|---|---|--|
| <i>Downingia pusilla</i> dwarf downingia | 2B.2 | Mesic sites in valley and foothill grassland and vernal pools. | March-May annual herb | Marginally suitable habitat within Project Area. Four CNDDDB occurrences reported from the vicinity of the Project Area include Schellville, Sonoma Valley Regional Park, Bennett Valley vernal pools and Van Hoosear Wildflower Preserve. | Moderate |
| <i>Erigeron biolettii</i> Streamside daisy | 3 | Occurs in broadleaf upland forest, cismontane woodland and rocky mesic areas of North Coast coniferous forests. Found on dry slopes, rocks, ledges along rivers. | June-October perennial herb | Marginally suitable habitat within Project Area. There are no CNDDDB occurrences within the Project Area. | Moderate |
| <i>Eriogonum luteolum</i> var. <i>caninum</i> Tiburon buckwheat | 1B.2 | Occurs in serpentine, sandy, gravelly soils of chaparral, cismontane woodland, coastal prairie and valley and foothill grasslands. | May-September annual herb | Upland serpentine species. No suitable habitat in Project Area. Two CNDDDB occurrences within the project vicinity at the Mt. Burdell Open Space Preserve. | No Potential |
| <i>Fritillaria liliacea</i> fragrant fritillary | 1B.2 | Occurs in coastal prairie, coastal scrub, and valley and foothill grassland, on clay or serpentine soils. | February-April perennial herb (bulbiferous) | Upland serpentine species. No suitable habitat in Project Area. Five CNDDDB occurrences within the project vicinity at the Mt. Burdell Open Space Preserve, Jack London State Historic Park, Van Hoosear Wildflower Preserve and Petaluma. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--|---|--------------------------------------|--|--|
| <i>Hemizonia congesta</i> ssp. <i>congesta</i> congested-headed hayfield tarplant | 1B.2 | Occurs in valley and foothill grassland, often in fallow fields, sometimes along roadsides. Hybridizes with <i>H. congesta</i> ssp. <i>lutescens</i> . | April-November annual herb | Marginally suitable habitat within Project Area. There are 4 CNDDDB occurrences within Project Area including south of Sonoma, northwest of Petaluma and in a field along Petaluma-Valley Ford Road. | Moderate |
| <i>Horkelia tenuiloba</i> thin-lobed horkelia | 1B.2 | Occurs in broad-leaved upland forest, chaparral and valley and foothill grasslands. Found in mesic openings and sandy substrates. | May-July perennial herb | Upland species. No suitable habitat in Project Area. One CNDDDB occurrence reported from ridge at headwaters of Nathanson and Agua Caliente Creek. | No Potential |
| <i>Leptosiphon jepsonii</i> Jepson's leptosiphon | 1B.2 | Occurs in chaparral and cismontane woodland. Prefers open to partially shaded grassy slopes on volcanic or periphery of serpentine substrates. Recognized as <i>L. liniflorus</i> in TJM. | March-May annual herb | Upland species. No suitable habitat in Project Area. Five CNDDDB occurrences within project vicinity including Sonoma Mountain, Sugarloaf Ridge State Park, Bennett Valley and Warm Springs Roads. | No Potential |
| <i>Lessingia hololeuca</i> woolly-headed lessingia | 3 | Occurs in coastal scrub, lower montane coniferous forest, valley and foothill grassland in clay, serpentine; roadsides, and fields. | June-October annual herb | Upland serpentine species. No suitable habitat in Project Area. There are no CNDDDB occurrences in the Project Area. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--|--|--------------------------------------|--|--|
| <i>Lupinus sericatus</i> Cobb Mountain lupine | 1B.1 | Occurs in broad-leaved upland forest, chaparral, cismontane woodland and lower montane coniferous forest. Found in stands of knobcone pine-oak woodland on open wooded slopes with gravelly and sometime serpentine soils. | March-June perennial shrub | Upland species. No suitable habitat in Project Area. Two CNDDDB occurrences in the vicinity of Bismark Knob, northeast of Sonoma. | No Potential |
| <i>Micropus amphiboles</i> Mt. Diablo cottonweed | 3.2 | Occurs in rocky sites of broad-leaved upland forest, chaparral, cismontane woodland and valley and foothill grasslands. | March-May annual herb | Upland species. No suitable habitat in Project Area. There are no CNDDDB occurrences in the Project Area. | No Potential |
| <i>Microseris paludosa</i> marsh microseris | 1B.2 | Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Similar to <i>M. lacinata</i> ssp. <i>leptosepala</i> . | April-June perennial herb | Upland species. No suitable habitat in Project Area. One CNDDDB occurrence reported from Stony Point Rd. north of Petaluma from 1937. | No Potential |
| <i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia | 1B.1 | Occurs in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland and vernal pools. Found on adobe or alkaline soils. | April-July annual herb | Marginal habitat in the Project Area. Five CNDDDB occurrences in the project vicinity include a vernal pool north of Bennett Valley Rd., southwest slope of Mt. Burdell, and Annadel State Park. | Low |
| <i>Penstemon newberryi</i> var. <i>sonomensis</i> Sonoma beardtongue | 1B.3 | Occurs in crevices of rock outcrops and talus slopes in chaparral. | April-August perennial herb | Upland species. No suitable habitat in Project Area. One CNDDDB occurrence reported from the summit of Hood Mountain. | No Potential |

Table B-1. Special status plant species with potential to occur in Zones 2A and 3A

| SPECIES NAME COMMON NAME | FEDERAL, STATE, & CNPS LISTING ¹ | HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES | FLOWERING PHENOLOGY/ LIFE FORM | HABITAT SUITABILITY & LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--|---|--|---|--|
| <i>Polygonum marinense</i> Marin knotweed | 3.1 | Occurs in coastal salt or brackish water marshes and swamps. Taxonomic status uncertain, related to <i>P. aviculare</i> possibly a synonym of the non-native <i>P. robertii</i> . | April-October annual herb | Salt marsh species. No suitable habitat in Project Area. One CNDDDB occurrence reported in 1945 from a salt marsh in Burdell. | No Potential |
| <i>Rhynchospora globularis</i> var. <i>globularis</i> round-headed beaked-rush | 2B.1 | Occurs in freshwater marshes and swamps. | July-August perennial herb (rhizomatous) | Marginal habitat in the Project Area. This species is highly restricted Pitkin and Perry marshes. No CNDDDB occurrences reported within the project vicinity. | Low |
| <i>Sidalcea calycosa</i> ssp. <i>rhizomata</i> Point Reyes checkerbloom | 1B.2 | Occurs in freshwater marshes and swamps near the coast. | April-September perennial herb (rhizomatous) | Coastline species. Marginally suitable habitat in Project Area. One historic CNDDDB occurrence from Petaluma in 1880. | Low |
| <i>Trifolium hydrophilum</i> saline clover | 1B.2 | Occurs in marshes and swamps, valley and foothill grassland, and vernal pools. Occurs on mesic and alkaline sites. | April-June annual herb | Marginally suitable habitat in the Project Area. One CNDDDB occurrence within the project vicinity from a vernal pool near Rohnert Park. | Moderate |
| <i>Viburnum ellipticum</i> <i>oval-leaved</i> <i>viburnum</i> | 2B.3 | Occurs in chaparral, cismontane woodland and lower montane coniferous forest. | May-June perennial shrub (deciduous) | Upland species. No suitable habitat in Project Area. Two CNDDDB occurrences within the project vicinity include Adobe Canyon and near El Cerrito Ranch in Sonoma. | No Potential |

¹ Legal Status

Federal listing:

- FE Federally listed as Endangered
- FT Federally listed as Threatened

California listing:

- SE State listed as Endangered
- ST State listed as Threatened
- SR State listed as Rare

CNPS listing (CEQA significance):

- 1B.1 Plants Rare, Threatened, or Endangered in California and elsewhere, seriously threatened in California.
- 1B.2 Plants Rare, Threatened, or Endangered in California and elsewhere, moderately threatened in California.
- 1B.3 Plants Rare, Threatened, or Endangered in California and elsewhere, not very threatened in California.
- 2B.1 Plants Rare, Threatened, or Endangered in California but more common elsewhere, seriously threatened in California.
- 2B.3 Plants Rare, Threatened, or Endangered in California but more common elsewhere, not very threatened in California.
- 3 Plants about which more information is needed, a review list.
 - 3.1 Plants about which more information is needed, a review list, seriously threatened in California.
 - 3.2 Plants about which more information is needed, a review list, moderately threatened in California.

² Local distribution determined by a search of the California Natural Diversity Database (CNDDDB) conducted on April 14 and 15, 2015. Search criteria for all species listed in the table included the 7.5 minutes quadrangles: Petaluma, Petaluma River, Sonoma, Cotati, Kenwood and Glen Ellen.

³ Potential for occurrence defined as:

No Potential: Habitat components of a species are not known to occur in along creeks and riparian areas in Zone 2A and 3A (Project Area). Habitats outside of the Project Area include: salt and brackish marsh, salt ponds, vernal pools, serpentine substrate, broad-leaved upland forest, chaparral, coniferous forest, and cismontane woodland. Zone 2A and 3A are outside the range of the species.

Low: Few of the habitat components meeting the species requirements may be present in the Project Area and/or few occurrence in the region. In these instances, the species is not likely to be present.

Moderate: Some of the habitat components meeting the species requirements are possibly present in the Project Area and there are some occurrences in the region. The species has a moderate probability of occurring at a maintenance site.

High: All of the habitat components meeting the species requirements are likely present in the Project Area and there are several known occurrences Zone 2A and 3A. The species has a high probability of occurring at a maintenance site.

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--------------------------------------|---|--|---------------------------------------|
| INVERTEBRATES | | | | |
| California freshwater shrimp <i>Syncaris pacifica</i> | FE SE | Low elevation, low gradient streams where riparian cover is moderate to heavy in Marin, Sonoma and Napa Counties. Utilizes pools and undercut banks with exposed roots out of direct streamflow. | Suitable habitat in Project Area. Six CNDDDB occurrences in the Project Area including, but not limited to, Sonoma Creek and Yulupa Creek. | High |
| Myrtle's silverspot butterfly <i>Speyeria zerene myrtleae</i> | FE | Larval food plant <i>Viola adunca</i> . Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; and possibly to the Russian River mouth. | No suitable habitat in the Project Area. No occurrences in the Project Area. | No Potential |
| San Bruno elfin butterfly <i>Callophrys (=Incisalia) mossii bayensis (=Incisalia)</i> | FE | Coastal, mountainous areas with grassy ground cover, near San Bruno mountain. Steep, north facing slopes within fog belt. | No suitable habitat in the Project Area. No occurrences in the Project Area. | No Potential |
| FISH | | | | |
| California Coastal Chinook Salmon <i>Oncorhynchus tshawytscha</i> | FT | Adults migrate upstream in fall. This species requires cold, clear, freshwater rivers and large creeks with gravel substrate for spawning. Juveniles (smolts) migrate downstream in spring/summer to the ocean. | There no established spawning runs in Sonoma or Petaluma creeks but strays are known to occur. | Low |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--------------------------------------|---|--|---------------------------------------|
| Central California Coast Coho Salmon <i>Oncorhynchus kisutch</i> | FE SE | Spawning occurs in well oxygenated streams with riffles, loose, silt-free gravel substrate. Preferred rearing habitat consists of slow water pools or cool back water areas where fish are hidden from predators and waters are cool and productive. | Coho are known from the mainstem Russian River, Dry Creek and a number of tributaries to Russian River. Coho are not known from any streams within the Project Area. | Low |
| Central California Coast steelhead <i>Oncorhynchus mykiss irideus</i> | FT, CH -- | This species requires cool water, adequate pool and riffle depths, moderate stream velocities. Adults spawn in clean gravel along moderate gradient creeks. Juveniles may rear one or more years in creeks and estuaries before migrating to the ocean. | Steelhead are known from two CNDDDB occurrences in the Project Area including, but not limited to Adobe Creek and Carriger Creek. Also, known from Sonoma and Stuarts Creeks. Several creeks in the Project Area likely provide habitat or are occupied by steelhead. Several creeks located in Zones 2A and 3A are designated Critical Habitat. | High |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--------------------------------------|---|---|---------------------------------------|
| Delta smelt <i>Hypomesus transpacificus</i> | FT SE | Inhabits the Sacramento-San Joaquin Delta; seasonally the Suisun Bay, Carquinez Straight and San Pablo Bay. Spawning occurs from January to June on submerged vegetation or sandy and rocky substrate in the upstream area of the Delta. | No known CNDDDB occurrences in the Project Area. The Project Area is unlikely to provide suitable spawning or rearing habitat. | Low |
| Sacramento splittail <i>Pogonichthys macrolepidotus</i> | -- SSC | Endemic to the lakes and rivers of the central valley, but now confined to the delta, Suisun Bay, associated marshes, lower Sacramento River and the Sutter and Yolo bypasses. Utilizes slow moving water and dead end sloughs; requires flooded vegetation for spawning and rearing. | The Petaluma River estuary apparently supports a self-sustaining population and is known from one CNDDDB occurrence of the intertidal zone of the Petaluma River. There are no records of splittail in any of the tributaries to the Petaluma River that are in the Project Area. | Low |
| Tidewater goby <i>Eucyclogobius newberryi</i> | FE SSC | Inhabits brackish water along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith river. Inhabits shallow lagoons and lower stream reaches where water is brackish to fresh and slow-moving to still. Prefers sand or mud substrate with abundant emergent and submerged vegetation. | There is no habitat for this species within the Project Area. No occurrences have been recorded in the Project Area. | No potential |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--------------------------------------|--|--|---------------------------------------|
| AMPHIBIANS / REPTILES | | | | |
| California red-legged frog <i>Rana draytonii</i> | FT SSC | A medium-sized frog that inhabits lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Often found in ponds, marshes, or slow-moving sections of creeks. Range extends from Redding to Baja California, Mexico. Local breeding occurs in winter. | There are 18 CNDDDB occurrences throughout the Project Area. Habitats include both ponds and creeks. Occurrences along creeks in the vicinity of the Project Area include: Marin Creek, San Antonio Creek, Champlin Creek, Kelly Creek, and Ellis Creek. Critical Habitat designated on Sonoma Mountain and west of Petaluma located within Zones 2A and 3A. | High |
| California tiger salamander <i>Ambystoma californiense</i> | FE ST | A large terrestrial salamander that inhabits grasslands and oak savannah in Sonoma County. Adults breed in vernal pools and seasonal wetlands. Endemic to central California lowlands and foothills. The known range in Sonoma County includes the northern Petaluma watershed (Zone 2A). | There are several reports in the lowlands of the northern Petaluma watershed between Cotati and Petaluma. Project Area creeks do not provide habitat for breeding but uplands adjacent to creeks may be used by adults. Critical Habitat designated north of Petaluma located within Zone 2A. | Moderate |
| Foothill yellow-legged frog <i>Rana boylei</i> | SSC | A medium-sized frog that inhabits moderate-gradient streams with cool clear water in woodland and coniferous forest. | Suitable habitat is present in many foothill creeks throughout Project Area including: Adobe, Carriger Creek, Stuart, and Sonoma creeks. | High |
| Western pond turtle <i>Emys</i> (=Actinemys) <i>marmorata</i> | SSC | Freshwater turtle that inhabits permanent or nearly permanent bodies of water with low velocities. Habitats include creeks, rivers, ponds, lakes, ditches. | Suitable habitat is present throughout the Project Area. Species has been reported in several creeks including: San Antonio Creek, Lichua Creek, Ellis Creek and tributaries to Petaluma River. | High |
| BIRDS | | | | |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--------------------------------------|---|---|---------------------------------------|
| Bank swallow <i>Riparia riparia</i> (nesting) | ST | Nests in colonies in vertical banks with friable soils. Breeds from April to August. Most of California's nesting colonies occur along the upper Sacramento River. | CNDDDB occurrence No. 296 was reported in 1893 at Sonoma Creek. The Project Area is located in the vicinity of the occurrence and marginal habitat may be available in or adjacent to the Project Area. | Low |
| Black swift <i>Cypseloides niger</i> | SSC | Inhabits coastal belt of Santa Cruz and Monterey Co; central and southern Sierra Nevada; San Bernardino and San Jacinto Mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely. Local summer resident of mountain foothill canyons, arrives in mid-May for nesting. | CNDDDB occurrence 27 in 1959 from Mt. Veeder which is in the vicinity of the Project Area. Limited suitable habitat present along streams within the Project Area. | Low |
| Burrowing owl <i>Athene cunicularia</i> | SSC | Valley bottoms and foothills with low vegetation and fossorial mammal activity. Nests on the ground in dens. | Reported to overwinter in southern Sonoma Valley. Limited suitable habitat present in Project Area. | Moderate |
| California black rail <i>Laterallus jamaicensis coturniculus</i> | ST | Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Permanent resident in the San Francisco Bay area and eastward through the Delta into Sacramento and San Joaquin Counties. | There are 6 CNDDDB occurrences within the project vicinity near San Pablo Bay. However, preferred tidal wetland habitat is not present in the Project Area. | Low |
| California clapper rail <i>Rallus longirostris obsoletus</i> | FE SE | Marshes around the San Francisco Bay area and east to Suisun Marsh. Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickleweed; feeds on mollusks removed from the mud in sloughs. | There are three CNDDDB occurrences for this species within the project vicinity. However, preferred tidal wetland habitat is not present in the Project Area. | Low |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--------------------------------------|--|---|---------------------------------------|
| California least tern (nesting colonies) <i>Sterna antillarum browni</i> | FE SE, FP | Nests colonially on open, undisturbed, sandy or gravelly shores near shallow-water feeding areas in estuaries. | There are no CNDDDB occurrences within the Project Area. No suitable nesting habitat or preferred foraging habitat occurs in the Project Area. | Low |
| Northern spotted owl <i>Strix occidentalis caurina</i> | FT SSC | Moist, dense coniferous old-growth forests of redwood, Douglas fir, western red cedar and other conifers. Nest in old raptor nest cavities or natural cavities in trees. | There are no CNDDDB occurrences within the Project Area. No suitable nesting habitat occurs in the Project Area, but potential foraging habitat is present. | Low |
| Salt marsh common yellowthroat <i>Geothlypis trichas sinuosa</i> | SSC | Resident of the San Francisco Bay Region in fresh and salt water marshes. Requires tall grasses, tule patches, and willow thickets for nesting. | Three CNDDDB occurrences recorded in the project vicinity in brackish marsh habitat near the Petaluma River. Preferred habitat is not present in the Project Area. | Low |
| San Pablo song sparrow <i>Melospiza melodia samuelis</i> | SSC | Uses tidal sloughs in pickleweed marshes; requires tall bushes (usually grindelia) along sloughs for cover, nesting, and songposts; forages over mudbanks and in the pickleweed. | Resident of salt marshes in north San Francisco and San Pablo Bays. Six CNDDDB occurrences within the project vicinity. However, no preferred habitat in the Project Area. | Low |
| Swainson's hawk <i>Buteo swainsoni</i> | ST | Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations. | One recorded occurrence in San Antonio Creek south of Petaluma from 1856. Possible suitable habitat occurs within the Project Area. Most nesting occurs in the Central Valley. May be an infrequent winter visitor. | Moderate |
| Tricolored blackbird <i>Agelaius tricolor</i> | SE SSC | Nomadic and colonial species, most numerous in central valley and vicinity. Largely endemic to California. Nests in emergent vegetation within aquatic and riparian habitats. | Known to nest at scattered locations in Lake, Sonoma, and Solano counties. CNDDDB Occurrence No. 325 from Copeland Creek in 1976. The Project Area provides potential habitat for this nomadic species. | Moderate |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|---|--------------------------------------|---|---|---------------------------------------|
| Western snowy plover (coastal populations) <i>Charadrius alexandrinus nivosus</i> | FT SSC | Twenty breeding sites are known in California from Del Norte to San Diego County. Inhabit coastal beaches above the normal high-tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent. | There are no CNDDDB occurrences within the Project Area. No suitable nesting habitat occurs in the Project Area. | No Potential |
| Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i> | FT SE | Inhabits open woodland and deciduous riparian woodland. Nests in deciduous woodlands, moist thickets, orchards, overgrown pastures. Requires patches of at least 25 acres of dense riparian forest with a canopy cover of at least 50 percent in both the understory and overstory. | Two CNDDDB reports north of Zone 2A. Marginal nesting may occur in the Project Area. | Low |
| MAMMALS | | | | |
| American badger <i>Taxidea taxus</i> | SSC | This carnivore inhabits open areas with friable soils in woodland, grassland, savannah and desert habitats. A fossorial mammal that preys predominately on ground squirrels and pocket gophers. | Four CNDDDB occurrences recorded in the vicinity of the Project Area. Marginal habitat is present in the Project Area. | Moderate |
| Pallid bat <i>Antrozous pallidus</i> | SSC, | Inhabits rocky terrain in open areas in lowlands, foothills and mountainous areas near water throughout California. Roosts in caves, rock crevices, mines, hollow trees, buildings and bridges in arid regions. | Nine CNDDDB occurrences within the vicinity of the Project Area. Bats may roost in riparian trees and forage over water and riparian corridors. | Moderate |

Table B-2. Special status fish and wildlife species with potential to occur in Zones 2A and 3A

| COMMON & SCIENTIFIC NAME | FEDERAL & STATE LISTING ¹ | HABITAT REQUIREMENTS | HABITAT SUITABILITY AND LOCAL DISTRIBUTION ² | POTENTIAL FOR OCCURRENCE ³ |
|--|--------------------------------------|---|---|---------------------------------------|
| Salt marsh harvest mouse <i>Reithrodontomys raviventris</i> | FE SE | Endemic to San Francisco, San Pablo and Suisun Bays. Inhabits salt marshes with dense plant cover of pickleweed and fathen adjacent to an upland site. | There are two CNNDDB occurrences for this species within the vicinity of the Project Area. However, no salt marsh occurs in the Project Area. | No Potential |
| Townsend's big-eared bat <i>Corynorhinus townsendii</i> | CT SSC, | Inhabits caves and mines, but may also use bridges, buildings, rock crevices and tree hollows in coastal lowlands, cultivated valleys and nearby hills characterized by mixed vegetation throughout California. Forages along edge habitats near water. | Bats may forage over water and along riparian corridors in the Project Area. Roosting habitat is marginal in the Project Area. | Moderate |

¹Legal Status

Federal listing:

- FE Federally listed as Endangered
- FT Federally listed as Threatened

California listing:

- SE State listed as Endangered
- ST State listed as Threatened
- SR State listed as Rare
- SSC Species of Special Concern

² Local distribution determined by a search of the CDFW California Natural Diversity Database (CNDDDB) conducted on April 14 and 15, 2015.

Search criteria for all species listed in the table included the 7.5 minutes quadrangles: Petaluma, Petaluma River, Sonoma, Cotati, Kenwood and Glen Ellen.

³Potential for occurrence defined as:

No Potential: Habitat components of a species are not known to occur in along creeks and riparian areas in Zone 2A and 3A (Project Area). Habitats outside of the Project Area include: salt and brackish marsh, salt ponds, vernal pools, serpentine substrate, broadleaved upland forest, chaparral, coniferous forest, and cismontane woodland. Zone 2A and 3A are outside the range of the species.

Low: Few of the habitat components meeting the species requirements may be present in the Project Area and/or few occurrence in the region. In these instances, the species is not likely to be present.

Moderate: Some of the habitat components meeting the species requirements are possibly present in the Project Area and there are some occurrences in the region. The species has a moderate probability of occurring at a maintenance site.

High: All of the habitat components meeting the species requirements are likely present in the Project Area and there are several known occurrences Zone 2A and 3A. The species has a high probability of occurring at a maintenance site.

Appendix C: Air Quality and Green House Gas Emission Calculations

Air Quality Emission Calculations, Vegetation Management

| Vegetation Management, Off-Road Equipment Air Quality Emissions | | | | | | | | | | | |
|---|-----------|-------------------|---------------------------|-------------|----------------|------------------------|-----------------------|------------------------|-----------------------|--------------------------------------|-------------------------------------|
| Vegetation Management | Hours/Day | Max Days per Year | Percent of time operating | Total Hours | hp | ROG ¹ (lbs) | CO ² (lbs) | NOx ³ (lbs) | PM ⁴ (lbs) | PM _{2.5} ⁴ (lbs) | PM ₁₀ ⁴ (lbs) |
| Vermeer bc 1500 Chipper (diesel) | 8 | 30 | 50% | 120 | 125 | 5.29 | 89.29 | 146.83 | 5.29 | 5.03 | 5.26 |
| Stihl Chainsaw (gas) | 8 | 30 | 50% | 120 | 3.1 | 0.20 | 2.35 | 4.00 | 0.29 | 0.20 | 0.29 |
| Stihl Hedger (gas) | 8 | 30 | 50% | 120 | 0.94 | 0.06 | 0.71 | 1.21 | 0.09 | 0.06 | 0.09 |
| | | | | | TOTALS: | 5.55 | 92.34 | 152.04 | 5.67 | 5.29 | 5.63 |
| <i>Assumptions:</i> | | | | | | | | | | | |
| <i>Up to 10 vegetation management projects per year and up to 3 days per project for a total of 30 days per year.</i> | | | | | | | | | | | |
| <i>Emission Factors from OffRoad2007</i> | | | | | | | | | | | |
| <i>Emissions (lbs) = Emission Factor (grams/hp-hour) * hp * total hours * 0.00220462 lb/gram</i> | | | | | | | | | | | |
| <i>Horsepower was taken from equipment specifications if available, otherwise a maximum for that type of equipment</i> | | | | | | | | | | | |
| <i>Equipment assumed to be approximately 10 years old from proposed project implementation (2016)</i> | | | | | | | | | | | |
| <i>PM 2.5 and PM10 was calculated from PM10 using CARB's PM2.5 fraction multiplier of total PM. http://www.arb.ca.gov/ei/speciate/speciate.htm#assnfrac</i> | | | | | | | | | | | |

¹ROG: reactive organic gases

²CO: carbon monoxide

³NOx: nitrogen oxides

⁴PM: particulate matter

| Vegetation Management, Transportation: On-Road Air Quality Emissions | | | | | | | | | |
|---|-------------------------------|--------|------|-------|-------|-----|-------|-------|-------|
| Vehicle | Equipment Type | Fuel | Fuel | Daily | Total | Max | Total | Total | Total |
| SCWA staff Environmental | light duty truck (LDT1 - GAS) | gas | 17 | 60 | 3 | 30 | 1800 | 106 | 60 |
| SCWA staff O&M | light duty truck (LDT1 - GAS) | gas | 17 | 60 | 3 | 30 | 1800 | 106 | 60 |
| Utility truck | T7 utility - DSL | diesel | 12.5 | 60 | 3 | 30 | 1800 | 144 | 60 |
| <p><i>Assumptions:</i> Up to 10 vegetation management project/year and up to 3 days/project for a total of 30 days/year. Vehicles are year 2010 models *Emission Factors were obtained from Tables 13.1 and 13.5 of 2013 Climate Registry Default Emission Factors, Released April 2, 2013. Available at http://theclimateregistry.org/wp-content/uploads/2015/01/2013-Climate-Registry-Default-Emissions-Factors.pdf (Accessed August 4, 2015).</p> | | | | | | | | | |

| Vegetation Management, Transportation: On-Road Air Quality Emissions | | | | | |
|--|------------------|------------------|-------------------|--------------------|-----------------|
| Vehicle | ROG ¹ | NOx ² | PM10 ³ | PM2.5 ³ | CO ⁴ |
| SCWA staff Environmental | 0.770691 | 0.849956 | 0.190757 | 0.082592 | 10.657487 |
| SCWA staff O&M | 0.770691 | 0.849956 | 0.190757 | 0.082592 | 10.657487 |
| Utility truck | 0.248994 | 5.537173 | 0.047558 | 0.022443 | 0.959708 |
| TOTALS | 1.79 | 7.24 | 0.43 | 0.19 | 22.27 |

¹ROG: reactive organic gases

²NOx: nitrogen oxides

³PM: particulate matter

⁴CO: carbon monoxide

Air Quality Emission Calculations, Erosion Protection

| Erosion Protection, Off-road Equipment | | | | | | | | | | | |
|---|-----------|-----|---------|-------|----------------|------------------|-----------------|------------------|-----------------|--------------------------------|-------------------------------|
| Vegetation Management | Hours/Day | Max | Percent | Total | hp | ROG ¹ | CO ² | NOx ³ | PM ⁴ | PM _{2.5} ⁴ | PM ₁₀ ⁴ |
| Vermeer bc 1500 Chipper (diesel) | 8 | 9 | 50% | 36 | 125 | 1.59 | 26.79 | 44.05 | 1.59 | 1.46 | 0.13 |
| 330D Cat Excavator (diesel) | 8 | 9 | 50% | 36 | 268 | 2.13 | 19.57 | 85.08 | 2.34 | 2.23 | 0.11 |
| | | | | | TOTALS: | 3.71 | 46.35 | 129.13 | 3.93 | 3.69 | 0.24 |
| <i>Assumptions:</i> | | | | | | | | | | | |
| Up to 3 erosion protection projects per year and up to 3 days per project for a total of 9 days per year. | | | | | | | | | | | |
| Chipper fuel consumption based on specs for Vermeer bc1500 | | | | | | | | | | | |
| Excavator: 270 hp, fuel consumption previously calculated from fuel logs for SMP by Rebecca Simonson. | | | | | | | | | | | |
| Excavator specs: http://www.ritchiespecs.com/specification?type=&category=Hydraulic+Excavator&make=Caterpillar&model=330D+L&modelid=92298 | | | | | | | | | | | |
| *Emission Factors were obtained from Tables 13.1 and 13.7 of <i>2013 Climate Registry Default Emission Factors</i> , Released April 2, 2013. | | | | | | | | | | | |
| Available at http://theclimateregistry.org/wp-content/uploads/2015/01/2013-Climate-Registry-Default-Emissions-Factors.pdf (Accessed August 4, 2015). | | | | | | | | | | | |
| PM 2.5 and PM10 was calculated from PM10 using CARB's PM2.5 fraction multiplier of total PM. http://www.arb.ca.gov/ei/speciate/speciate.htm#assnfrac | | | | | | | | | | | |

¹ROG: reactive organic gases

²CO: carbon monoxide

³NOx: nitrogen oxides

⁴PM: particulate matter

| Erosion Protection, Transportation: On-Road Air Quality Emissions | | | | | | | | | | |
|---|---------------------------------------|------|--------|-------|------|-----|-------|-------|-------|----|
| Vehicle | Equipment Type | Fuel | Fuel | Daily | Days | Max | Total | Total | Total | |
| SCWA staff Environmental | light duty truck (LDT1) | | gas | 17 | 60 | 3 | 9 | 540 | 32 | 18 |
| SCWA staff O&M | light duty truck (LDT1) | | gas | 17 | 60 | 3 | 9 | 540 | 32 | 18 |
| utility truck | heavy duty utility (T7 utility - DSL) | | diesel | 12.5 | 60 | 3 | 9 | 540 | 43 | 18 |
| 18-wheeler: Excavator transport | heavy duty (T7 tractor - DSL) | | diesel | 5.9 | 30 | 2 | 6 | 180 | 31 | 6 |
| <i>Assumptions:</i> | | | | | | | | | | |
| <i>Vehicles are year 2010 models</i> | | | | | | | | | | |
| <i>Excavator would be transported to site on day 1 and from site on day 3 of project work using an 18-wheeler but stored onsite for duration of project work.</i> | | | | | | | | | | |
| <i>Estimated fuel consumption of 18-wheeler obtained via http://www.truckinginfo.com/article/story/2013/06/how-to-improve-fuel-efficiency-on-the-road.aspx (Accessed August 13, 2015)</i> | | | | | | | | | | |
| <i>*Emission Factors were obtained from Tables 13.1 and 13.5 of 2013 Climate Registry Default Emission Factors, Released April 2, 2013.</i> | | | | | | | | | | |
| <i>Available at http://theclimateresistry.org/wp-content/uploads/2015/01/2013-Climate-Registry-Default-Emissions-Factors.pdf (Accessed August 4, 2015).</i> | | | | | | | | | | |

| Erosion Protection, Transportation: On-Road Air Quality Emissions | | | | | |
|---|------------------------------|------------------------------|---|--|-----------------------------|
| Vehicle | ROG ¹ (lbs) | NOx ² (lbs) | PM10 ³ (lbs) | PM2.5 ³ (lbs) | CO ⁴ (lbs) |
| SCWA staff Environmental | 0.231207 | 0.254987 | 0.057227 | 0.024778 | 3.197246 |
| SCWA staff O&M | 0.231207 | 0.254987 | 0.057227 | 0.024778 | 3.197246 |
| Utility truck | 0.162917 | 6.089305 | 0.135500 | 0.060521 | 0.636524 |
| 18-wheeler: Excavator transport | 0.126642 | 3.173080 | 0.070898 | 0.044795 | 0.438962 |
| TOTALS | 0.75 | 9.77 | 0.32 | 0.15 | 7.47 |
| | ROG¹ (lbs) | NOx² (lbs) | PM_{2.5}³ (lbs) | PM₁₀³ (lbs) | CO⁴ (lbs) |
| Project-related Annual Emissions | 11.80 | 298.18 | 9.31 | 6.62 | 168.44 |
| | ROG¹ | NOx² | PM₁₀³ | PM_{2.5}³ | CO⁴ |
| Project-related Daily Emissions | 0.30 | 7.65 | 0.24 | 0.17 | 4.32 |
| BAAQMD Daily Construction | 54 | 54 | 82 | 54 | 9.0 ppm |
| Threshold Exceeded? | No | No | No | No | No |

¹ROG: reactive organic gases

²NOx: nitrogen oxides

³PM: particulate matter

⁴CO: carbon monoxide

Green House Gas Emission Calculations, Vegetation Management

| Vegetation Management, Off-road Equipment | | | | | | | | | | | | | |
|---|-----------|------------------|-------------------|---------------------------|---------------------------|---------------|--------------------------------------|-------------------------------------|--------------------------------------|--------------------|--------------------|---------------------|-------------|
| Vegetation Management | Hours/Day | Days per Project | Max Days per Year | Percent of time operating | Fuel Consumption (gal/hr) | Total Gallons | Emission Factors ¹ | | | Emissions | | | |
| | | | | | | | CO ₂ kg/gal (Table 13.1*) | CH ₄ g/gal (Table 13.7*) | N ₂ O g/gal (Table 13.7*) | kg CO ₂ | kg CH ₄ | kg N ₂ O | |
| Vermeer bc 1500 Chipper (diesel) | 8 | 3 | 30 | 50% | 7 | 840.00 | 10.21 | 0.58 | 0.26 | 8576.40 | 0.49 | 0.22 | |
| Stihl Chainsaw (gas) | 8 | 3 | 30 | 50% | 0.25 | 29.80 | 8.78 | 0.50 | 0.22 | 261.63 | 0.01 | 0.01 | |
| Stihl Hedger (gas) | 8 | 3 | 30 | 50% | 0.20 | 23.44 | 8.78 | 0.50 | 0.22 | 205.78 | 0.01 | 0.01 | |
| | | | | | | | | | | TOTALS: | 9043.81 | 0.51 | 0.23 |
| <i>Assumptions:</i> | | | | | | | | | | | | | |
| Up to 10 vegetation management projects per year and up to 3 days per project. | | | | | | | | | | | | | |
| Chipper fuel consumption based on specs for Vermeer bc1500 | | | | | | | | | | | | | |
| Chainsaw and hedger gas tanks are refilled twice per hour. Gas consumption was calculated using this rate and fuel tank volume for Stihl brand equipment. | | | | | | | | | | | | | |
| Chainsaw (Stihl, 0.47L, 14,000 rpm, 2.3 kW): 0.47L x 2/hour = 0.94 L per hour. 0.94L/hour x 0.264172 gal/L = 0.248322 gal/hour | | | | | | | | | | | | | |
| Hedger (Stihl, 0.94bhp, 12.5 oz): 12.5 oz x 2/hour = 25 oz/hour. 25 oz/hour x 0.0078125 gal/oz = 0.195313 gal/hr | | | | | | | | | | | | | |
| *Emission Factors were obtained from Tables 13.1 and 13.7 of 2013 Climate Registry Default Emission Factors, Released April 2, 2013. | | | | | | | | | | | | | |
| Available at http://theclimateregistry.org/wp-content/uploads/2015/01/2013-Climaturegistry-Default-Emissions-Factors.pdf (Accessed August 4, 2015). | | | | | | | | | | | | | |

¹CO₂: carbon dioxide

CH₄: methane

N₂O: nitrous oxide

| Vegetation Management, On Road Vehicles | | | | | | | | | | | | | | | |
|---|------------------|-----------|---------------------|--------------------------|--------------------|-------------------|-------------|---------------|--------------------------------------|------------------------------------|-------------------------------------|--------------------|--------------------|---------------------|-------------|
| Vehicle | Equip-ment Type | Fuel Type | Fuel Econ-omy (mpg) | Daily Travel (miles/day) | Total Days/Project | Max Days per Year | Total miles | Total gallons | Emission Factors ¹ | | | Emissions | | | |
| | | | | | | | | | CO ₂ kg/gal (Table 13.1*) | CH ₄ g/mi (Table 13.5*) | N ₂ O g/mi (Table 13.5*) | Kg CO ₂ | kg CH ₄ | kg N ₂ O | |
| SCWA staff Environmental | light duty truck | gas | 17 | 60 | 3 | 30 | 180 | 11 | 8.78 | 0.0173 | 0.0036 | 92.96 | 0.00 | 0.00 | |
| SCWA staff O&M | light duty truck | gas | 17 | 60 | 3 | 30 | 180 | 11 | 8.78 | 0.0163 | 0.0066 | 92.96 | 0.00 | 0.00 | |
| Utility truck | heavy duty | diesel | 12.5 | 60 | 3 | 30 | 180 | 14 | 10.21 | 0.0051 | 0.0048 | 147.02 | 0.00 | 0.00 | |
| | | | | | | | | | | | | TOTALS: | 332.95 | 0.01 | 0.00 |
| <i>Assumptions:</i> | | | | | | | | | | | | | | | |
| Up to 10 vegetation management projects per year and up to 3 days per project. | | | | | | | | | | | | | | | |
| Vehicles are year 2010 models | | | | | | | | | | | | | | | |
| *Emission Factors were obtained from Tables 13.1 and 13.5 of 2013 Climate Registry Default Emission Factors, Released April 2, 2013. | | | | | | | | | | | | | | | |
| Available at http://theclimateregistry.org/wp-content/uploads/2015/01/2013-Climateregistry-Default-Emissions-Factors.pdf (Accessed August 4, 2015). | | | | | | | | | | | | | | | |

¹CO₂: carbon dioxide
 CH₄: methane
 N₂O: nitrous oxide

Green House Gas Emission Calculations, Erosion Protection

| Erosion Protection, Off-road Equipment | | | | | | | | | | | | |
|---|-----------|------------------|-------------------|---------------------------|---------------------------|---------------|-------------------------------|-------------------------|-------------------------|--------------------|--------------------|---------------------|
| Vegetation Management | Hours/Day | Days per Project | Max Days per Year | Percent of time operating | Fuel Consumption (gal/hr) | Total Gallons | Emission Factors ¹ | | | Emissions | | |
| | | | | | | | CO2 kg/gal (Table 13.1*) | CH4 g/gal (Table 13.7*) | N2O g/gal (Table 13.7*) | kg CO ₂ | kg CH ₄ | kg N ₂ O |
| Vermeer bc 1500 Chipper (deisel) | 8 | 3 | 9 | 50% | 7 | 84.00 | 10.21 | 0.58 | 0.26 | 857.64 | 0.05 | 0.02 |
| 330D Cat Excavator | 8 | 3 | 9 | 50% | 8.00 | 96.00 | 10.21 | 0.58 | 0.26 | 980.16 | 0.06 | 0.02 |
| | | | | | | | | | TOTALS: | 1837.80 | 0.10 | 0.05 |
| <i>Assumptions:</i> | | | | | | | | | | | | |
| Up to 3 erosion protection projects per year and up to 3 days per project. | | | | | | | | | | | | |
| Chipper fuel consumption based on specs for Vermeer bc1500 | | | | | | | | | | | | |
| Excavator: 270 hp, fuel consumption previously calculated from fuel logs for SMP by Rebecca Simonson. | | | | | | | | | | | | |
| Excavator specs: http://www.ritchiespecs.com/specification?type=&category=Hydraulic+Excavator&make=Caterpillar&model=330D+L&modelid=92298 | | | | | | | | | | | | |
| *Emission Factors were obtained from Tables 13.1 and 13.7 of <i>2013 Climate Registry Default Emission Factors</i> , Released April 2, 2013. | | | | | | | | | | | | |
| Available at http://theclimateregistry.org/wp-content/uploads/2015/01/2013-Climate-Registry-Default-Emissions-Factors.pdf (Accessed August 4, 2015). | | | | | | | | | | | | |

¹CO₂: carbon dioxide

CH₄: methane

N₂O: nitrous oxide

| Erosion Protection, On Road Vehicles | | | | | | | | | | | | | | | |
|--|------------------|--|-----------|--------------------|--------------------------|------------------|-------------------|-------------|---------------|--------------------------------------|-------------------------------------|--------------------------------------|--------------------|--------------------|---------------------|
| Vehicle | Equipment Type | | Fuel Type | Fuel Economy (mpg) | Daily Travel (miles/day) | Days per Project | Max Days per Year | Total miles | Total gallons | Emission Factors ¹ | | | Emissions | | |
| | | | | | | | | | | CO ₂ kg/gal (Table 13.1*) | CH ₄ g/mi (Table 13.5**) | N ₂ O g/mi (Table 13.5**) | kg CO ₂ | kg CH ₄ | kg N ₂ O |
| SCWA staff Environmental | light duty truck | | gas | 17 | 60 | 3 | 9 | 540 | 32 | 8.78 | 0.0173 | 0.0036 | 278.89 | 0.01 | 0.00 |
| SCWA staff O&M | light duty truck | | gas | 17 | 60 | 3 | 9 | 540 | 32 | 8.78 | 0.0163 | 0.0066 | 278.89 | 0.01 | 0.00 |
| Utility truck | heavy duty | | diesel | 12.5 | 60 | 3 | 9 | 540 | 43 | 10.21 | 0.0051 | 0.0048 | 441.07 | 0.00 | 0.00 |
| 18-wheeler: | | | | | | | | | | | | | | | |
| Excavator transport | heavy duty | | diesel | 5.9 | 30 | 2 | 6 | 60 | 10 | 10.21 | 0.0051 | 0.0048 | 103.83 | 0.00 | 0.00 |
| | | | | | | | | | | | | TOTALS: | 1102.69 | 0.02 | 0.01 |
| <i>Assumptions:</i> | | | | | | | | | | | | | | | |
| Vehicles are year 2010 models | | | | | | | | | | | | | | | |
| Excavator would be transported to site on day 1 and from site on day 3 of project work using an 18-wheeler but stored onsite for duration of project work. | | | | | | | | | | | | | | | |
| Estimated fuel consumption of 18-wheeler obtained via http://www.truckinginfo.com/article/story/2013/06/how-to-improve-fuel-efficiency-on-the-road.aspx (Accessed August 13, 2015) | | | | | | | | | | | | | | | |
| *Emission Factors were obtained from Tables 13.1 and 13.5 of <i>2013 Climate Registry Default Emission Factors</i> , Released April 2, 2013. | | | | | | | | | | | | | | | |
| Available at http://theclimateregistry.org/wp-content/uploads/2015/01/2013-Climate-Registry-Default-Emissions-Factors.pdf (Accessed August 4, 2015). | | | | | | | | | | | | | | | |

¹CO₂: carbon dioxide
CH₄: methane
N₂O: nitrous oxide

| | TOTAL GHG Annual Emissions ¹ | | |
|---|---|--|------------------|
| | CO ₂ | CH ₄ | N ₂ O |
| kg | 12317.26 | 0.65 | 0.29 |
| GWP | 1 | 21 | 13 |
| kg CO ₂ e | 12317.26 | 13.57 | 3.74 |
| MT CO₂e | 12.32 | 0.01 | 0.00 |
| ¹ CO ₂ : carbon dioxide CH ₄ : methane N ₂ O: nitrous oxide | | | |
| PROJECT TOTAL | 12.33 | MT CO₂e¹/yr | |
| BAAQMD Threshold | 1,100 | MT CO₂e/yr | |
| Threshold Exceeded? | | No | |

¹Million metric ton of carbon dioxide equivalent