NOTICE OF DETERMINATION

TO: County Clerk
County of Alameda
1106 Madison Street, First Floor
Oakland, CA 94607

FROM: City of Livermore
1052 South Livermore
Livermore, CA 94550

SUBJECT: NOTICE OF DETERMINATION in compliance with Section 21108 or 21152 of the Public Resources Code.

PROJECT

Title: Stream Maintenance Permit
Location: Citywide
Description: Program for the management and maintenance activities that will occur in flood control channels and creeks within the SMP Area. The SMP establishes programmatic guidance to conduct maintenance activities and avoid, minimize and mitigate environmental impacts. The SMP also provides the organizational framework to oversee routine creek and channel maintenance activities and ensure the program is compliant with the terms and conditions of its permits.
Applicant: City of Livermore
City's Contact: Steve Stewart, Principal Planner
Telephone: (925) 960-4450

This is to advise that the City of Livermore as Lead Agency has approved and has made the following determinations regarding the above-described project:

1. The Project will not have a significant effect on the environment.
2. A Mitigated Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures were made a condition of the approval of the project.
4. A Statement of Overriding Considerations was not adopted.
5. Findings were made pursuant to the provisions of CEQA.

All environmental documents and project records may be examined at the Community and Economic Development Department, 1052 S. Livermore Avenue, Livermore, CA 94550.

Signature: _____
Name & Title: Steve Stewart, Principal Planner
Project Approval Date: September 17, 2015

CEQA MITIGATED NEGATIVE DECLARATION

LIVERMORE STREAM MAINTENANCE PROGRAM

PREPARED FOR:

City of Livermore
1052 S. Livermore Ave.
Livermore, CA 94550
Contact: Pam Lung
925.960.4538

PREPARED BY:

ICF International
101 Lucas Valley Road, Suite 260
San Rafael, CA 94903
Contact: Kathryn Gaffney
415.507.7131

August 2015

ICF International. 2015. *CEQA Proposed Mitigated Negative Declaration – Livermore Stream Maintenance Program.* April. San Rafael, CA. Prepared for City of Livermore, CA.

CEQA Mitigated Negative Declaration

Project

Project Name:	Livermore Stream Maintenance Program (SMP)
Project Location:	The project area includes the city limits of the City of Livermore, plus the areas the City owns by Doolan Canyon between Portola Avenue and Interstate 580, plus Sycamore Grove Park, in eastern Alameda County, California. The "SMP Area" is that portion of the project area that includes the creeks and other channels in the project area within which maintenance activities could occur. See Initial Study Figure 1 for a vicinity map and Figure 2 for an SMP Area map.
Project Description:	The Livermore SMP describes the management and maintenance activities that will occur in flood control channels and creeks within the SMP Area. The SMP establishes programmatic guidance to conduct maintenance activities and avoid, minimize and mitigate environmental impacts. The SMP also provides the organizational framework to oversee routine creek and channel maintenance activities and ensure the program is compliant with the terms and conditions of its permits.
Project Proponent:	City of Livermore Community & Economic Development Department Engineering Division 1052 S. Livermore Avenue Livermore, CA 94550

Findings

It is hereby determined that, based on the information contained in the attached Initial Study, the project will not have a significant adverse effect on the environment.

This determination is based on consideration of the SMP Mitigation Program and one additional mitigation measure identified in the attached Initial Study. Mitigation measures necessary to avoid the potentially significant effects on the environment are listed in the SMP Mitigation Program and below and are also discussed in the attached Initial Study. The SMP and the Initial Study are hereby incorporated and fully made part of this Mitigated Negative Declaration. The City of Livermore has hereby agreed to implement each of the identified mitigation measures, which would be adopted as part of the which would be adopted as part of the Mitigation Monitoring and Reporting Program and the Livermore Stream Maintenance Program.

Mitigation Measures

Mitigation Measure BIO-1: Springtown Alkali Sink Preservation, Restoration, and Management

If impacts to the valley sink scrub habitat within the Springtown Alkali Sink cannot be avoided, the City shall restore or preserve valley sink scrub habitat at a ratio of 1.5:1 (mitigation to impact) for permanent impacts within the greater Springtown Alkali Sink area with preference for habitat adjacent to the existing Springtown Alkali Sink Preserve. Restored and/or preserved habitat will be protected and managed similar the Springtown Alkali Sink Preserve.

Temporary impacts to valley sink scrub habitat within the Springtown Alkali Sink will be mitigated at a 1.1:1 ratio (mitigation to impact) through enhancement of the project site following the impacting SMP activity based on the Tier 1 mitigation approach. If the site does not allow sufficient space to mitigate temporary impacts, the mitigation ratio will be met using the Tier 2 mitigation approach (i.e., off-site mitigation in the SMP Area). Mitigation actions will ensure that the functions and values of the stream reach are improved over pre-project conditions.

The City will identify success criteria for the selected Tier 1 and/or Tier 2 approach, including establishment of native valley sink scrub plant species cover within 70% of local reference populations, native valley sink scrub plant species composition within 70% of local reference populations, demonstration of success in both cover and composition for at least 3 years. Restored areas will be monitored for at least 5 years until success criteria are met. Adaptive management guidelines will be established for actions to be taken if the success criteria are not met. If progress is not satisfactory, then adaptive management actions (including replanting, nonnative species removal, etc.) may be implemented.

Steve Stewart, Principal Planner

9-17-15

Date

INITIAL STUDY

PROJECT

Project Name:	Livermore Stream Maintenance Program (SMP or Program)
Project Location:	The project area includes the city limits of the City of Livermore, plus the areas the City owns by Doolan Canyon between Portola Avenue and Interstate 580, plus Sycamore Grove Park, in eastern Alameda County, California. The "SMP Area" is that portion of the project area that includes the creeks and other channels in the project area within which maintenance activities could occur.
Project Description:	The Livermore SMP describes the management and maintenance activities that will occur in flood control channels and creeks within the SMP Area. The SMP establishes programmatic guidance to conduct maintenance activities and avoid, minimize, and mitigate environmental impacts. The SMP also provides the organizational framework to oversee routine creek and channel maintenance activities and ensure the program is compliant with the terms and conditions of its permits.
Project Proponent:	City of Livermore Community Development Department Engineering Division 1052 S. Livermore Avenue, Livermore, CA 94550
Property Owner:	City of Livermore, Alameda County Flood Control and Water Conservation District Zone 7, Livermore Area Recreation and Parks District, or private
City's Contact:	Pamela Lung, P.E., CFM, (925) 454-5036

ENVIRONMENTAL SETTING

Stream Maintenance Program Description

The primary purpose of the Livermore Stream Maintenance Program (SMP) is to provide an efficient and organized program to conduct stream maintenance activities, comply with all relevant environmental regulations, and maintain flood capacity while enhancing the Planning Area's natural resources. Implementation of the SMP calls for maintenance activities within reaches of several creeks and channels in the Greater Livermore Area, as well as stream enhancement activities such as planting of native species in a way that is consistent with flood control needs. The primary creeks and channels included in the SMP are Arroyo Las Positas, Altamont Creek, Arroyo Seco, Arroyo Mocho, and Arroyo del Valle. Secondary tributary creeks and channels include the Realigned Arroyo Las Positas, Cottonwood Creek, Collier Creek, and Kellogg Creek, as well as other unnamed tributaries and concrete channels. Table 1-1 of the SMP lists all of the creek and channel reaches, individual reach lengths, and figure sheet references where associated vegetation mapping is depicted by reach.

The SMP has three primary activities: sediment management, vegetation management, and bank stabilization. In addition to the three core SMP activities, the SMP would also involve other smaller and infrequent maintenance activities such as bridge maintenance, culvert repair or replacement, access road

and trail maintenance, and trash and debris removal. The SMP also addresses the transport and disposal of collected sediment and vegetation. SMP activities are summarized below.

Sediment Management

Sediment management refers to the removal of excess sediment from constructed flood protection facilities such as flood control channels, culverts, and storm drain outlets. The Tri-Valley floor has historically been a depositional area, and sediment management has consistently been a concern within the SMP Area. Sediment removal would be localized at individual crossings, culverts, outlets, other in-channel facilities, or other individual reaches where sediment accumulation is determined to be a concern. All creek and channel sediment removal activities would follow the impact avoidance and minimization approach and principles described in Chapter 4 of the SMP and would incorporate the best management practices (BMPs) described in Chapter 7 of the SMP and presented in Table 7-1 in the SMP.

The SMP would primarily involve sediment removal to maintain storm flow conveyance from adjacent streets into the creek and channel system. There are currently 161 storm drain outlets and64 road and bridge crossings in City-operated creeks and channels that require routine maintenance for flood protection. In some instances, such as the stretch of Arroyo Las Positas above its confluence with Altamont Creek, the SMP also includes reestablishment of channel capacity through sediment and vegetation removal focused on maintaining an open low-flow channel within the wider channel flood zone. One of the objectives of the City General Plan is to maintain the creeks in as natural a state as possible while maintaining the health and safety of the community. In addition, every creek reach would be evaluated for habitat restoration and enhancement opportunities.

Chapter 4 of the SMP describes the approach the City will take when implementing sediment management activities to ensure impact avoidance. Sediment management actions will consider system-wide issues, not only issues related to a specific management site. For example, maintenance has been deferred in many of the SMP Area channels for several years. Large storm events could dislodge some of this built up sediment and deposit it downstream on areas that support wetland habitat. Conducting sediment management in areas of aggradation will both avoid localized flooding, as well as potential impacts downstream if no management action were to be taken. As such, sediment management will be implemented to both avoid impacts in the area managed, but also to avoid impacts in areas downstream.

Sediment removed from City facilities would be used on-site where possible (e.g., for a bank stabilization) and allowable, or for other projects nearby. If removed sediment is unsuitable for use locally it may be hauled off-site to suitable upland disposal sites or to the Altamont Landfill. The City is also researching options to provide clean sediment for various local or regional needs, including coastal restoration projects. Sediment reuse and disposal activities are essential to the completion of the sediment removal, bank stabilization, and vegetation removal activities of the Program. The City anticipates that on average the SMP would involve removing between 1,000 and 2,000 cubic yards of sediment per year not including the Holmes Street bridge site which averages closer to 20,000 cubic yards of gravel per year. More detail on sediment disposal activities is provided in the SMP.

Vegetation Management

Vegetation management refers to the trimming and/or removal of vegetation that is significantly decreasing flood conveyance capacity or presenting a fire hazard, particularly where infrastructure (e.g., bridges, culverts, storm drain outlets) or adjacent properties are at risk in SMP Area creeks and channels, and ancillary flood control facilities. Vegetation management activities would be conducted to maintain flow conveyance capacity, establish a canopy of riparian trees, and control invasive vegetation. Vegetation management and removal activities would be relatively consistent from year to year, though locations may change depending on recent growth. Vegetation management would also include the

planting of new trees and shrubs in creeks and channels in accordance with the SMP's mitigation program (Chapter 8 in the SMP).

Bank Stabilization

Bank stabilization would involve the repair and stabilization of eroded or eroding stream or reservoir banks. Bank stabilization activities would occur in creeks and channels, including culvert outlets in streams. All bank stabilization activities would follow the impact avoidance and minimization approach and principles described in Chapter 4 of the SMP and would incorporate the BMPs described in Chapter 7 and presented in Table 7-1 in the SMP.

Similar to the sediment removal activities described above, the number of new bank stabilization projects undertaken in a given year would depend on weather and hydrologic conditions during recent years. Over the past ten years, the City has only implemented one bank stabilization project. With permits in place, it is estimated that upwards of three bank stabilization projects could occur over the ten-year SMP permit term. The need for bank stabilization would be more likely in wet years when banks shear or slump due to bank soil saturation, high soil pore water pressure, and high stream velocities.

Bridge Maintenance

Bridge maintenance would consist of repairing existing bridges (e.g., concrete patching or localized reinforcement), treatment of scour erosion around bridge structures, painting, graffiti removal and cleaning. Such maintenance would require foot and vehicle access into the creek or channel bottom.

Other Maintenance Activities

Other Program maintenance activities occurring on an annual basis as needed could include:

- in-kind repair and replacement of culverts;
- habitat restoration and landscape maintenance;
- maintaining creek and channel access roads and trails for accessibility; and
- removing trash and debris from creeks and channels.

Activities Not Covered in the SMP

Activities not covered under the SMP include:

- maintenance activities on streams outside of the SMP Area for which no maintenance agreement exists;
- new culvert construction projects;
- bridge replacement projects;
- capital improvement projects (CIPs) intended to increase capacity beyond the original flood conveyance design or to replace bridges;
- emergency activities and procedures; and
- The Springtown Golf Course Water Diversion.

Routine stream maintenance would not include projects that would alter the designed flood conveyance capacity of a creek or channel. Large construction projects and CIPs that cost over $100,000 are not considered routine stream maintenance and are not included in the SMP. However, future CIPs may

consider using, or adapting, the SMP to cover their maintenance needs and mitigation once their project becomes operational and requires maintenance.

Pre-Maintenance Planning Approach and Impact Avoidance

The pre-maintenance planning approach is a four-step process that would begin with broad level activity planning and focus down to the details informing maintenance at a specific project site. At the broadest scale, Maintenance Principles would be used to provide overarching guidance for maintenance activities. Framing Considerations would build on the Maintenance Principles and frame the extent of the SMP's three primary activities: Sediment Management, Vegetation Management, and Bank Stabilization. Framing Considerations would guide the maintenance activities to effectively work in alignment with natural processes and thereby avoid or reduce potential impacts. Following the Framing Considerations, Maintenance Goals would be used to set the desired outcomes of the program. The fourth and final planning scale describes Maintenance Triggers. These are events that would initiate the need for maintenance activities to occur. In sum, the maintenance approach would follow a sequence of four planning steps that operate at different scales as follows:

1. *Maintenance Principles:* provide overarching guidance for SMP activities including impact avoidance and minimization approaches;
2. *Framing Considerations:* provide more specific context for the primary SMP activities while considering stream functions;
3. *Goals:* describe desired outcomes for maintenance activities; and
4. *Triggers:* define the need and timing for maintenance activities.

The following maintenance principles were developed as guidelines to avoid and minimize environmental impacts of the SMP.

1. No Unnecessary Intervention
2. Understand the System and Its Processes
3. Consider Adjacent Land Uses
4. Apply System Understanding to Maintenance Actions
5. Manage for Incremental Ecologic Improvement
6. Integrate Maintenance Activities towards Sustainability (to reduce frequency of maintenance)

When applied, these principals would determine when action is needed, consider the natural function of the system, provide an understanding of local physical constraints, identify sensitive habitats, consider watershed processes, identify the maintenance activities needed at the reach and site scale, and seek solutions to minimize the on-going need for maintenance activities at a particular site or reach. Chapter 4 of the SMP provides additional details on how these principles would be applied through framing considerations, goals, and triggers.

Impact Reduction and Minimization

Measures to protect natural resources, as well as "good-neighbor" policies were drafted to reduce the effects of maintenance activities. Table 7-2 in the SMP organizes these BMPs according to the following topics:

- General impact avoidance and minimization
- Good neighbor policies

- Air quality
- Biological resources (including species-specific measures)
- Cultural resources
- Construction and seismicity
- Hazardous materials safety
- Vegetation management
- Water quality and creek/channel protection

The SMP describes which BMP measures apply to which program activities. The SMP therefore provides an iteratively process for program operations to identify the appropriate protective measures based on the nature of the planned maintenance activity, and the resources found in the reach where the activity would occur.

Program Mitigation

Through the use and application of avoidance and minimization measures and maintenance principals described above, potential impacts would be greatly reduced. However, potential impacts that would not be reduced through avoidance measures or project elements may require additional mitigation.

The SMP proposed a three tier approach to mitigation, whereby habitat and ecologic functions are enhanced or restored: (1) on-site and in-kind where the maintenance work occurred; (2) off-site on other SMP Area reaches and in-kind; or (3) off-site within the watershed. The three tier mitigation approach would ensure that mitigation seeks first and foremost to compensate for the impacts occurring at the specific project reach, and then expands to consider other potential reaches or watershed opportunities if compensation cannot be entirely accomplished in the project reach.

The SMP habitat mitigation activities would be implemented within a short time period following the SMP activities themselves (typically at the end of the maintenance season to take advantage of the wet season to support new plantings, but no more than one year from conclusion of the maintenance season).season The following requirements would be met before impacts are allowed to occur:

- The mitigation plan requires the approval of the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFW), and San Francisco Bay Regional Water Quality Control Board (SFBRWQCB);
- Ownership or demonstrated authority to implement mitigation at the mitigation site shall be obtained; and
- Financial assurances to construct and maintain the mitigation site shall be established.

Contractual arrangements and financial assurances will be provided, all mitigation plans will be approved by the relevant regulatory agencies, and mitigation projects will be monitored for success, and remedial actions taken if necessary.

SMP mitigation would occur annually as an ongoing program. Certain mitigation projects may exceed that needed for a given year's portfolio of projects, and if so, would be banked for future years with advance approval from USACE, USFWS, CDFW, and SFBRWQCB. In these cases, the impacts of the SMP would be effectively pre-mitigated. The mitigation monitoring program (described in Section 8.4.4 of the SMP) would provide feedback on the effectiveness of mitigation efforts to inform and improve future mitigation.

Mitigation Approaches

Planting Program

The City's mitigation program would include a variety of planting and habitat enhancement approaches. The primary objective would be to enhance riparian habitat through greater canopy cover, shading, and development of a functioning understory along channels that are currently degraded with grass cover dominated by non-native ruderal species.

Based on the SMP preferred plant palette (see SMP Table 8-2), the City would plant trees and shrubs as on-site mitigation at all reach scale maintenance activity sites. For instance, localized sediment removal or culvert repair projects would include a tree planting component if there is available room to plant. Planting would also occur in conjunction with the removal of exotic and invasive species and the replacement of such species with native riparian vegetation suited to conditions in the SMP Area.

Planting new trees along reaches where vegetation was removed during sediment removal or vegetation thinning activities would help mitigate the temporary impacts of vegetation removal from channel bed and banks. As these trees mature they would provide shade to the active channel, provide nesting and foraging habitat for many birds and small mammals, moderating water temperatures and providing forage for aquatic species, and helping reduce the need for future sediment management as shading discourages cattail establishment which in turn traps sediment.

When considered at the watershed scale the planting program would help provide connectivity, via a vegetated corridor, from the headwaters of the watershed to the receiving water body at the downstream end of the SMP Plan Area. Connected landscapes would provide enhanced habitat for local and migrating species. In addition, increased vegetation along the stream banks would improve water quality through shading the stream and cooling water temperatures, and through filtering runoff entering the creek.

The City has already begun developing a partnership with the Living Arroyos program focused on restoring urban streams in the Livermore-Amador Valley. Living Arroyos is a partnership of the City of Livermore, Urban Creeks Council, and Zone 7 Water Agency. The goal of the partnership is to restore and enhance urban stream and riparian (streamside) habitats while continuing to protect drinking water supplies and maintaining current levels of flood protection. Living Arroyos, with financial support from the City, will implement many of the riparian enhancement projects that will be required for SMP implementation. More complex planting projects, particularly those that accompany a larger restoration project, may be conducted by other third parties hired by the City.

The City has also begun discussions with the Alameda County Resource Conservation District to identify possible partnerships for restoration project implementation and/or management.

Invasive and Exotic Plant Removal Program

Specific mitigation activities would include the targeted removal of invasive and exotic species. The removal of invasive and exotic species would provide more room for desirable native species to establish. An increase in abundance of native vegetation over non-native vegetation would improve overall riparian health. Removing exotic species also would help prevent the monoculture common to areas dominated with exotics. When replaced with a diverse selection of native vegetation, the channels of the SMP Plan Area could support a more diverse set of species including insects, birds, small mammals, amphibians, and reptiles.

Low-Flow Channel Design

For reach scale sediment removal projects, the City would design and implement a low-flow inset channel along the bed of the flood control channel. Low-flow channels would be implemented together with sediment removal activities.

A key objective of a low-flow channel would be to successfully transport sediment under lower flow conditions (annual flows and smaller). This is achieved through increased flow depth and velocity under low-flow conditions which are adequate to convey and pass sediments under the smaller flow conditions. This reduces sediment deposition, and ultimately reduces the need to conduct sediment removal activities. A sustainable low-flow channel would also improve water quality, enhance in-stream habitats, and enhance the stream's function as a migration corridor for fish.

Success Criteria and Remedial Actions

As described in Chapter 8 of the SMP, a performance standard is a measure of a habitat characteristic used to assess the progress of the restored habitat toward meeting a success criterion. A success criterion is a measure that indicates whether the mitigation goals have been achieved at the end of the performance monitoring period. Channel bed plantings are considered wetland plantings. Channel toe of slope, floodplain bench, lower slope, upper slope, and top of bank plantings are considered riparian plantings.

Performance standards for wetland, riparian shrub, and riparian willow plantings are applied during the first 4 years of the monitoring period, and success criteria are applied at the end of the 5-year monitoring period. Performance standards for riparian trees are applied during the first 9 years of the monitoring period, and success criteria are applied at the end of the monitoring period. Performance standards for riparian trees change from individual plant success to vegetative cover trends at Year 5 due to the density of vegetation and the ultimate success criteria. The mitigation plantings will be evaluated annually using the annual performance standards. The performance standards and success criteria for wetland and riparian plantings are summarized in SMP Table 8-3.

In the event of poor plant survival or failure to meet stated performance criteria, corrective measures will be implemented, including replanting to reach the 75% goal shown in SMP Table 8-3. The number of plant replacements will be above the threshold to meet the percent survival. The monitoring period for replacement plants will be reset to Year 1, while the original surviving plantings remain on the original monitoring schedule. As a last resort, new mitigation would be provided elsewhere should a project not be capable of meeting performance criteria. For the in-channel zone, selective replanting may be conducted along the low-flow channel to help stabilize it when needed.

Schedule and Work Cycle

The SMP would be managed as an annual cycle of activities. Stream reconnaissance and assessments would begin in late winter or early spring, followed by the development of the maintenance work plan. During the spring months, the year's maintenance projects would be further refined and described, appropriate mitigation would be identified, and the relevant regulatory agencies overseeing program permitting would be notified. After receiving agency (USACE, USFWS, CDFW, and SFBRWQCB) concurrence that the proposed projects are covered by the SMP permits, projects would then be implemented during the summer season, when the creeks and channels are at their driest. During the fall, and before the end of the year, an annual summary report of the year's maintenance, mitigation, and monitoring activities would be sent to the permitting agencies.

Following the submittal of the annual maintenance report, regulatory agency staff would be invited to a review meeting to discuss the events, maintenance activities, and lessons learned over the past work

cycle. Every 5 years, the City and the permitting agencies would review the SMP for its overall effectiveness, and to renew permits for the SMP as needed. This review would include an assessment of maintenance activities conducted to date, BMPs employed, adequacy of the SMP Mitigation Program, SMP data management, adequacy of SMP adaptive updates and revisions, and overall program coordination and communication between the City and the regulatory permitting agencies. The program would be flexible to accommodate new resource information, management standards, and maintenance technology over time. As envisioned, the SMP would be a "living program" that is updated and modified as needed.

Study Area Description

The City of Livermore conducts planning activities within the "Planning Area." The Planning Area includes City limits, plus the areas the City owns by Doolan Canyon and between Portola Avenue and Interstate 580, plus Sycamore Grove Park. The regional context of the City of Livermore's SMP is shown in Figure 1.

SMP activities will occur within the "SMP Area," which is defined as the limit of maintenance activity (i.e., the area within which maintenance activities would occur) as shown in Figure 2. This includes drainage reaches of Collier Canyon Creek, Arroyo Las Positas Tributary, Arroyo Las Positas, Altamont Creek, Realigned Arroyo Las Positas, Arroyo Seco, Arroyo Mocho, Arroyo Del Valle, and Granada Channel, as well as a 75-foot buffer on either side of the covered drainage reaches.

For the purposes of this Initial Study, the "study area" includes all areas that may be affected directly or indirectly by the project. The study area may vary by resource topic depending on the project's sphere of influence relative to an individual resource topic.

Ownership and Responsible Agency

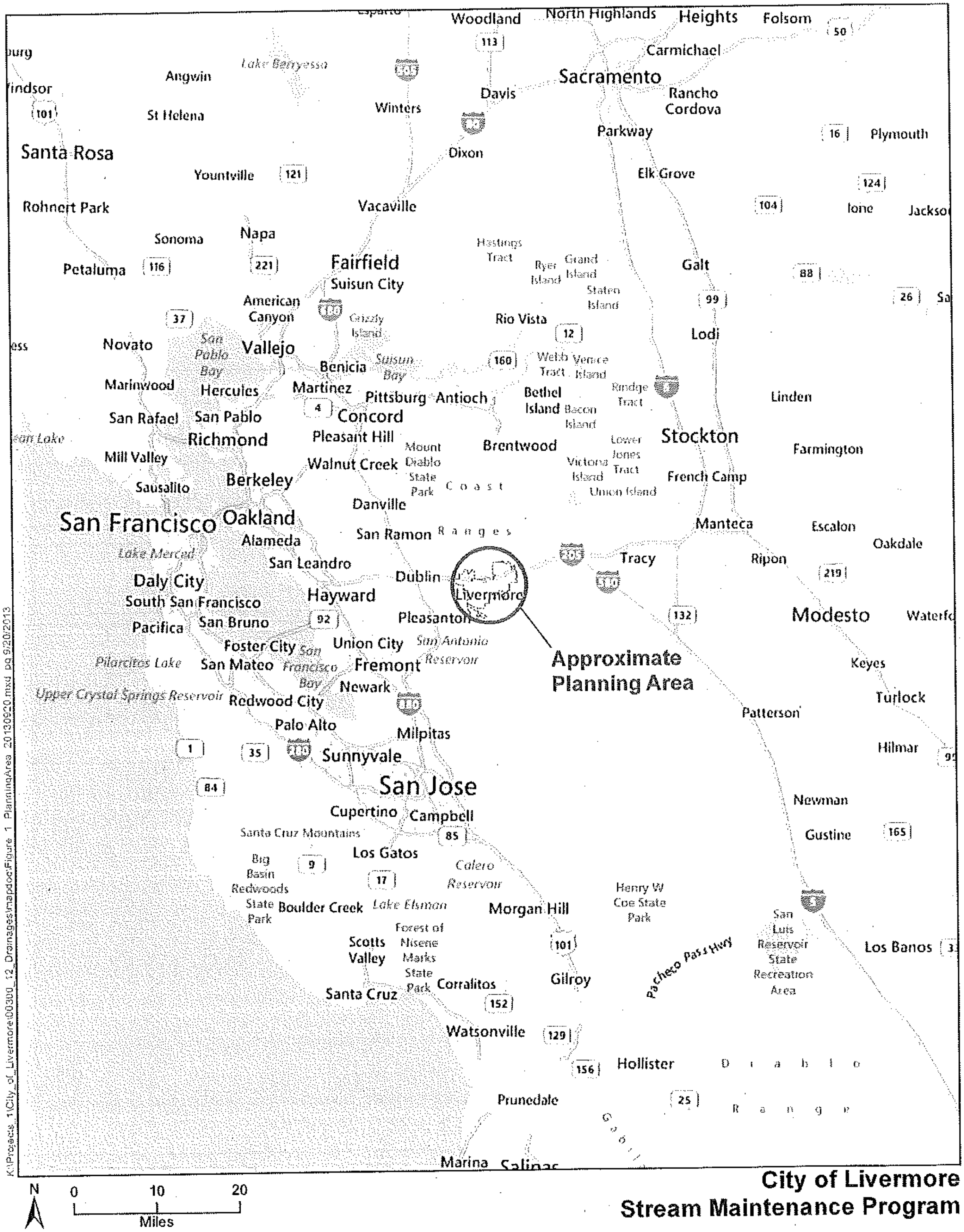
The SMP Area streams managed under the SMP are owned by the City, the Alameda County Flood Control and Water Conservation District Zone 7 (Zone 7), Livermore Area Recreation and Parks District (LARPD), or by a private landowner (see Figure 1-2 in SMP Appendix A). The City owns and/or manages for private entities approximately 24.1 miles (56.6% of SMP Area streams), Zone 7 owns approximately 10 miles (23.4%), and LARPD owns approximately 7.1 miles (16.6%). In addition, Zone 7 partially owns (i.e., owns portions of a given stream cross-section based on parcel boundaries) approximately 0.8 mile (1.8%), and has drainage easements on approximately 0.8 mile (1.8%).

The City has a Recreational Use License Agreement in place with Zone 7 to conduct maintenance of stream channels where the City also maintains an access easement for recreational trails that follow the channel. This agreement is long-standing (initiated in 1968 and re-issued in 2005) and allows the City to use Zone 7 facilities to construct, improve, maintain and operate facilities for parks and recreation purposes. The Agreement has a term of 25 years, and may be renewed in 25-year increments.

Privately owned reaches are not regularly maintained by the City, but the City will implement maintenance actions to clear debris or excess vegetation at the request of the landowner and if the City determines that the site requires maintenance. Under the SMP, LARPD may manage reaches it owns or reaches owned by the City according to established management agreements.

GENERAL PLAN AND ZONING

- General Plan Land Use Designation: Creeks and channels are generally designated as Open Space. Areas adjacent to creeks and channels have a variety of urban, rural, agricultural and open space designations.



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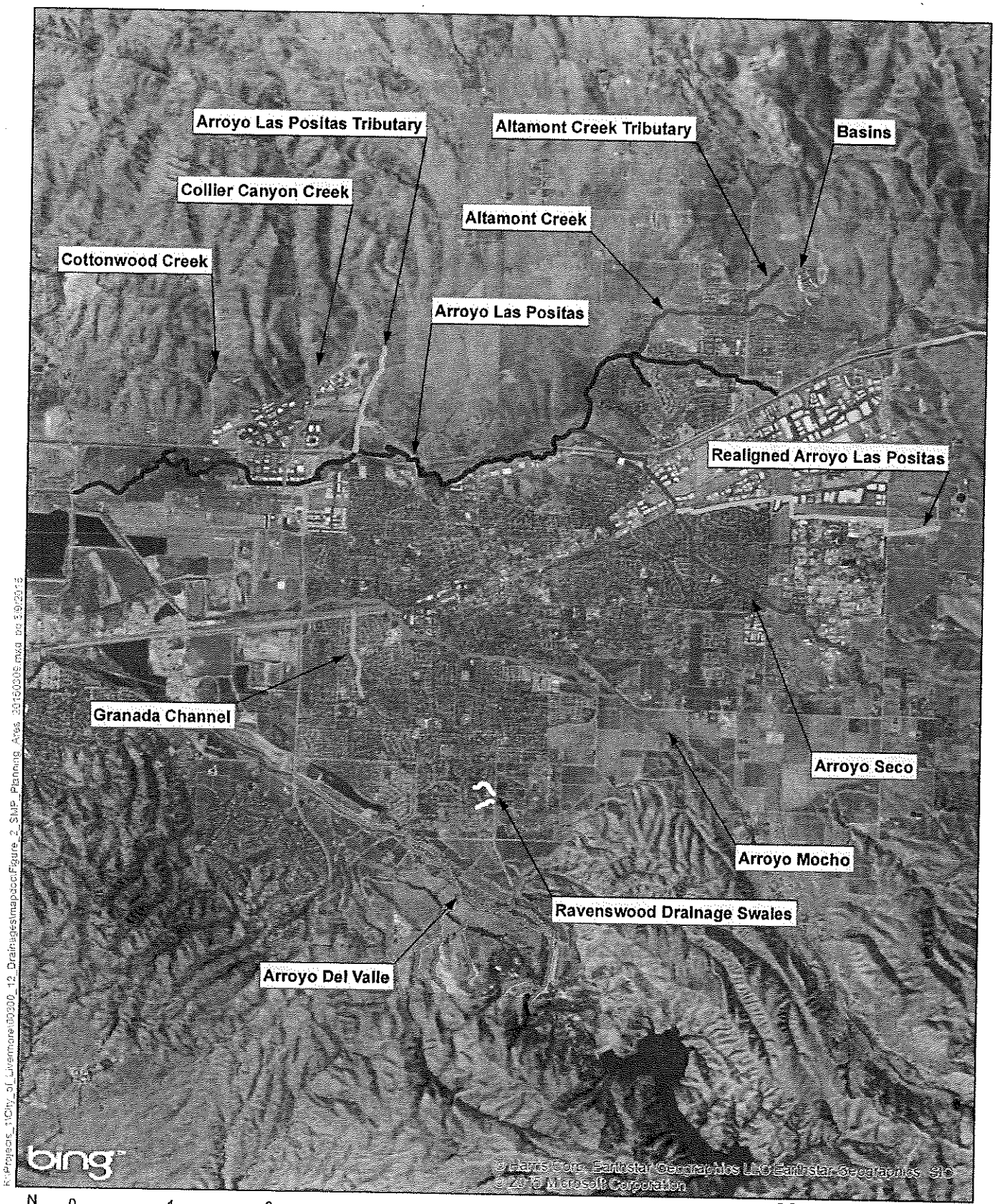
LIVERMORE CALIFORNIA

ICF

Source: Bing Maps

City of Livermore
Stream Maintenance Program

Figure 1
SMP Vicinity



City of Livermore
Stream Maintenance Program

Figure 2
SMP Area

- Zoning District: Creeks and channels are generally zoned OS-F (Open Space-Flood Plain). Areas adjacent to creeks and channels have a variety of zoning districts consistent with General Plan land use designations.

OTHER REQUIRED APPROVALS

Other agencies whose approval is required for this project (and permits needed):

- California Department of Fish and Wildlife (California Fish and Game Code Section 1602 Streambed Alteration Agreement);
- California Department of Fish and Wildlife (California Endangered Species Act [CESA] Section 2081 Incidental Take Permit;
- San Francisco Bay Regional Water Quality Control Board (Clean Water Act [CWA] Section 401 Water Quality Certification and Porter Cologne Waste Discharge Requirements);
- U.S. Army Corps of Engineers (CWA Section 404 Nationwide Permit); and
- U.S. Fish and Wildlife Service (Endangered Species Act [ESA] Section 7 Biological Opinion and Incidental Take Permit).

EVALUATION OF ENVIRONMENTAL IMPACTS

The following list indicates environmental factors that would be potentially affected by this project. Check marked factors indicate there may be a "Potentially Significant Impact" or a "Potentially Significant Impact Unless Mitigated."

____	Aesthetics	____	Land Use and Planning
____	Air Quality	____	Noise
X	Biological Resources	____	Public Services
X	Cultural Resources	____	Recreation
____	Energy/Mineral Resources	____	Transportation/Circulation
____	Geophysical	____	Utilities and Service Systems
____	Greenhouse Gas Emissions	____	Water
____	Hazards	____	Mandatory Findings of Significance

1. AESTHETICS

Would the proposal:

a. Adversely affect a scenic vista or scenic highway?

No Impact.

There are no State designated scenic highways through Livermore. Maintenance of stream channels will not affect vistas or scenic routes designated in the General Plan.

b. Have a demonstrable negative aesthetic effect?

Less than Significant Impact.

Maintenance activities would involve the removal of vegetation and/or sediment from stream channels thereby altering their appearance. However, due to the nature of sediment movement in the creeks and channels maintained under the SMP, in-channel vegetation quickly re-establishes, largely on an annual basis. Thus, in-channel vegetation will re-establish and the alteration of the appearance is temporary.

c. **Create a new source of substantial light or glare, adversely affecting day or nighttime views in an area?**

No Impact.

Maintenance activities would occur during daylight hours and will not create new sources or light or glare.

2. AGRICULTURE RESOURCES

Would the proposal:

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

No Impact.

Stream maintenance activities are intermittent and restricted to the stream bed, banks and necessary staging and access areas directly adjacent to the stream channel. Maintenance activities would not impact adjacent land uses nor require or induce the conversion of adjacent farm lands to non-agricultural use.

b. **Conflict with existing zoning for agricultural use, or a Williamson Act contract?**

No Impact.

See 2.a. above.

c. **Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?**

No Impact.

See 2.a. above.

3. AIR QUALITY

This section provides an analysis of air quality impacts resulting from the proposed project. It summarizes the overall regulatory framework for air quality management in California and the region, describes existing air quality conditions in the SMP Area, and identifies sensitive land uses. Environmental impacts related to air quality, as well as mitigation measures to reduce or eliminate potential impacts, are also discussed. Please refer to Section 7 for a discussion of greenhouse gas (GHG) emissions and climate change impacts.

Environmental Setting

Regional Climate and Topography

The air quality study area for the project is located within the Livermore Valley in the San Francisco Bay Area Air Basin (SFBAAB). The Livermore Valley is a sheltered inland valley within the Diablo Range. Maximum summer temperatures in the valley range from the high-80s to the low-90s, with extremes in the 100s. Strong Pacific high pressure cells from the west are common in the afternoons. These cells, when combined with hot inland temperatures, cause onshore pressure gradients, which produce strong, afternoon winds.

The potential for air pollution in the Livermore Valley is high, especially in the summer and fall. Air movement during the summer months is weakened by inversions, which trap and concentrate pollutants near the surface. The valley not only traps locally generated pollutants, but also emissions from San Francisco, Alameda, Contra Costa and Santa Clara counties. On northeasterly wind flow days, most common in the early fall, ozone may be carried west from the San Joaquin Valley to the Livermore Valley (Bay Area Air Quality Management District 2010).

Air Quality Management

The air quality management agencies of direct importance in the SMP Area are the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and the Bay Area Air Quality Management District (BAAQMD). EPA and ARB have established national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), respectively, for the following six pollutants: CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), lead, and PM, including PM less than or equal to 10 microns in diameter (PM10) and PM less than or equal to 2.5 microns in diameter (PM2.5). ARB and BAAQMD are responsible for ensuring that these standards are met. Table 1 summarizes the NAAQS and CAAQS.

Table 1. Federal and State Ambient Air Quality Standards

Criteria Pollutant	Average Time	California Standards	National Standards[a]	
			Primary	Secondary
Ozone	1-hour	0.09 ppm	None[b]	None[b]
	8–hour	0.070 ppm	0.075 ppm	0.075 ppm
Particulate Matter (PM10)	24-hour	50 mg/m^3	150 mg/m^3	150 mg/m^3
	Annual mean	20 mg/m^3	None	None
Fine Particulate Matter (PM2.5)	24-hour	None	35 mg/m^3	35 mg/m^3
	Annual mean	12 mg/m^3	12 mg/m^3	15 mg/m^3
Carbon Monoxide	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None
Nitrogen Dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide[c]	Annual mean	None	0.030 ppm	None
	24-hour	0.04 ppm	0.014 ppm	None
	3-hour	None	None	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	None
Lead	30-day Average	1.5 mg/m^3	None	None
	Calendar quarter	None	1.5 mg/m^3	1.5 mg/m^3
	3-month average	None	0.15 mg/m^3	0.15 mg/m^3
Sulfates	24-hour	25 mg/m^3	None	None
Visibility Reducing Particles	8-hour	–[d]	None	None
Hydrogen Sulfide	1-hour	0.03 ppm	None	None
Vinyl Chloride	24-hour	0.01 ppm	None	None

Notes:
ppm= parts per million.
mg/m^3 = micrograms per cubic meter.

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for State Implementation Plans.

[c] The annual and 24-hour NAAQS for SO_2 only apply for one year after designation of the new 1-hour standard to those areas that were previously nonattainment for 24-hour and annual NAAQS.

[d] CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more due to particles when relative humidity is less than 70%.

Sources: California Air Resources Board 2012.

Existing Air Quality Conditions

The existing air quality conditions in the study area can be characterized by monitoring data collected in the region. The nearest air quality monitoring station in the vicinity of the project area is the Livermore monitoring station, which is located at 793 Rincon Avenue. Table 2 summarizes data from the Livermore station for the last three years for which complete data are available (2010-2012). Air quality concentrations are expressed in terms of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

As shown in Table 2, the monitoring station has experienced violations of the NAAQS and CAAQS) for all pollutants except CO and NO_2.

Table 2. Air Quality Monitoring Data Measured at the Livermore Monitoring Station

Pollutant Standards	2010	2011	2012
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.150	0.115	0.102
Maximum 8-hour concentration (ppm)	0.097	0.084	0.090
Number of days standard exceeded[a]			
CAAQS 1-hour (>0.09 ppm)	3	3	2
CAAQS 8-hour (>0.070 ppm)	3	2	3
NAAQS 8-hour (>0.075 ppm)	6	9	4
Carbon Monoxide (CO)			
No data available			
Nitrogen Dioxide (NO_2)			
State maximum 1-hour concentration (ppm)	0.058	0.057	0.043
State second-highest 1-hour concentration (ppm)	0.056	0.053	0.043
Annual average concentration (ppm)	0.011	0.011	–
Number of days standard exceeded			
CAAQS 1-hour (0.18 ppm)	0	0	0
Particulate Matter (PM10)			
No data available			
Particulate Matter (PM2.5)			
National[c] maximum 24-hour concentration ($\mu g/m^3$)	34.7	45.4	31.1
National[c] second-highest 24-hour concentration ($\mu g/m^3$)	31.2	39.7	27.1
Stated maximum 24-hour concentration ($\mu g/m^3$)	34.7	23.6	–
Stated second-highest 24-hour concentration ($\mu g/m^3$)	31.2	23.2	–
National annual average concentration ($\mu g/m^3$)	7.6	7.8	6.6
State annual average concentration ($\mu g/m^3$)[b]	7.6	–	–
Number of days standard exceeded[a]			
NAAQS 24-hour (>35 $\mu g/m^3$)	0	2	0
Sulfur Dioxide (SO_2)			
No data available			

Notes:
ppm = parts per million.
NAAQS = National Ambient Air Quality Standards.
CAAQS = California Ambient Air Quality Standards.
$\mu g/m^3$ = micrograms per cubic meter.
mg/m^3 = milligrams per cubic meter.
> = greater than.
[a] An exceedance is not necessarily a violation.
[b] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Source: California Air Resources Board 2013a.

Attainment Status

Local monitoring data (Table 2) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as:

- **Nonattainment**—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- **Maintenance**—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- **Attainment**—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- **Unclassified**—assigned to areas were data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3 summarizes the attainment status of Alameda County with regard to the NAAQS and CAAQS.

Table 3. Federal and State Attainment Status of Alameda County

Pollutant	Federal	State
Ozone (1 hr)	–	Serious Nonattainment
Ozone (8 hr)	Marginal Nonattainment	Nonattainment
CO	Maintenance	Attainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
Sources: U.S. Environmental Protection Agency 2012; California Air Resources Board 2013b.		

Sensitive Receptors

Sensitive receptors are defined as locations where pollutant-sensitive members of the population may reside or where the presence of air pollutant emissions could adversely affect use of the land. Sensitive members of the population include those who may be more negatively affected by poor air quality than other members of the population, such as children, the elderly, or the infirmed. In general, residential areas, hospitals, daycare facilities, elder-care facilities, elementary schools, and parks typically contain a high concentration of these sensitive population groups.

The study area for the air quality analysis of sensitive receptors is defined as the area within which maintenance activities would occur and the adjacent areas that may be affected by localized emissions). Several streams and maintenance areas are surrounded by dense vegetation, whereas others run adjacent to residential land uses. Sensitive receptors, including homes, places of worship, and schools are therefore prevalent throughout the study area.

Air Quality Significance Thresholds

The BAAQMD is responsible for ensuring that state and federal ambient air quality standards are not violated within the SFBAAB. Analysis requirements for construction- and operational-related pollutant emissions are contained in BAAQMD's (2011) CEQA Guidelines. BAAQMD's CEQA Guidelines also contain thresholds of significance for ozone, CO, PM2.5, PM10, toxic air contaminates (TACs), and odors; these thresholds are presented in Table 4.

Table 4. BAAQMD Thresholds of Significance

Pollutant	Construction	Operations
ROG	54 lbs/day	54 lbs/day or 10 tons/year
NO_x	54 lbs/day	54 lbs/day or 10 tons/year
CO	–	Violation of CAAQS
PM10 (total)	–	–
PM10 (exhaust)	82 lbs/day	82 lbs/day or 15 tons/year
PM2.5 (exhaust)	54 lbs/day	54 lbs/day or 10 tons/year
PM10 /PM2.5 (fugitive dust)	BMPs	–
TACs (project-level)	Increased cancer risk of 10 in 1 million; increased non-cancer risk of greater than 1.0 (hazard index [HI]); PM2.5 increase of greater than 0.3 micrograms per cubic meter	Same as construction
TACs (cumulative)	Increased cancer risk of 100 in 1 million; increased non-cancer risk of greater than 10.0; PM2.5 increase of greater than 0.8 microgram per cubic meter at receptors within 1,000 feet	Same as construction
Odors	–	Five complaints per year averaged over 3 years
Source: Bay Area Air Quality Management District 2011.		

In March 2012, an Alameda County Superior Court ruled that BAAQMD needed to comply with CEQA prior to adopting their 2010 CEQA Guidelines, which included significance thresholds for criteria air pollutants and GHGs. The Superior Court did not determine whether the thresholds were valid on the merits, but found that the adoption of the thresholds was a project under CEQA. The court ordered a writ of mandate ordering BAAQMD to set aside the thresholds and cease their dissemination until BAAQMD complied with CEQA. In May 2012, BAAQMD filed an appeal with the Court of Appeal, First Appellate District, and the plaintiff filed a cross-appeal shortly thereafter.

While BAAQMD is not recommending its significance thresholds for use by local agencies at this time, the City has independently reviewed the BAAQMD proposed thresholds and determined that they are supported on substantial evidence and are appropriate for use to determine significance in the environmental review of this project. Specifically, the City has determined that the BAAQMD thresholds are well-grounded on air quality regulations, scientific evidence, and scientific reasoning concerning air quality and GHG emissions. Using these thresholds for the project also allows a rigorous standardized approach of determining whether the Project would cause a significant air quality impact. BAAQMD's Justification Report explains the agency's reasoning for adopting the thresholds (Bay Area Air Quality Management District 2009).

Impact Analysis

Would the proposal:

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

Less than Significant Impact.

Alameda County is currently designated a nonattainment area for the federal 8-hour ozone and PM2.5 standards, as well as maintenance area for the federal CO standard (Table 3). The most

recent BAAQMD air quality attainment plans are the 2001 Ozone Attainment Plan and the 1994 CO Redesignation Request and Maintenance Plan. BAAQMD also recently adopted the 2010 Clean Air Plan, which provides an integrated strategy to control ozone, PM, TACs, and GHG emissions. The BAAQMD plans estimate future emissions in the SFBAAB and determine strategies necessary for emissions reductions through regulatory controls. Emissions projections are based on population, vehicle, and land use trends typically developed by the BAAQMD, Metropolitan Transportation Commission (MTC), and Association of Bay Area Governments (ABAG).

A project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds estimates used to develop applicable air quality plans, which, in turn, would generate emissions not accounted for in the regional emissions budgets. Therefore, the proposed project is evaluated to determine if it is consistent with the land use designations and growth anticipated in the BAAQMD air quality attainment plans.

The purpose of the proposed project is to improve and define the management and maintenance of engineered and modified flood control channels and non-modified natural creeks within the City. As discussed in Section 16, *Transportation/Traffic*, the project would not permanently change the existing or planned transportation network or traffic patterns in the area. The project would also not add any additional capacity to existing roadways. Likewise, as described in Section 10, *Land Use and Planning*, the project would not conflict with any applicable land use plan or contribute to regional employment or population growth. Implementation of the project would generate emissions (discussed below), but these emissions are not expected to impede attainment or maintenance of the NAAQS or CAAQS.

Based on the above analysis, the project is consistent with recent growth projections for the region and would not conflict with the current BAAQMD air quality plans. This impact would be less than significant.

b. Violate any air quality standard or contribute to an existing or projected air quality violation?

Less than Significant Impact.

Implementation of the project would generate emissions of ROG, NO_X, CO, PM10, and PM2.5 over the course of the 10-year permit period. Emissions would originate from heavy-duty equipment exhaust, employee vehicle exhaust, haul truck vehicle exhaust, and land disturbance. Criteria pollutant emissions generated by these sources were quantified using emission factors developed by CalEEMod (version 2011.1.1), the ARB's EMFAC2011 model, and information provided by the project applicant. It was assumed that project implementation would begin in 2014 and include the following nine components:

1. Sediment Removal
2. Vegetation Management
3. Bank Stabilization
4. Bridge Maintenance
5. Road Maintenance
6. Habitat Restoration
7. Culvert Repair
8. Trash Removal
9. Reconnaissance

The first five components could occur any time during the construction season (July through September), whereas components 7–9 could occur any time during the year. Habitat restoration (#6) would only occur after completion of the construction period (October). To ensure a conservative analysis, maximum daily emissions generated by components 1–5 and components 7–9 were estimated assuming all equipment associated with components 1–5 and components 7–9 would operate at the same time—this assumes that all activities during the construction season could occur concurrently with annual activities. The resulting analysis gives the maximum project-related air quality impact and represents a worst-case analysis as actual project components may occur sporadically over the implementation period.

Estimated emission levels associated with project implementation are summarized in Table 5. Emissions estimates include application of the BAAQMD's basic and enhanced construction mitigation measures, as described in the project description. Detailed information on emissions modeling and quantification methods may be found in Appendix A.

Table 5. Estimated Criteria Pollutant Emissions (pounds per day)

Period	ROG	NO_X	CO	PM10		PM2.5	
				Exhaust	Dust	Exhaust	Dust
Construction Season[a]	7.3	49.6	2.1	1.7	0.1	1.7	0.0
Restoration	1.8	11.9	0.1	0.4	0.0	0.4	0.0
BAAQMD Thresholds	54	54	-	82	BMPs	54	BMPs

Notes:
[a] Assumes concurrent implementation all project components (1–5 and 7–9) except habitat restoration (6).

As shown in Table 5, implementation of the project would not generate ROG, NO_X, or PM exhaust in excess of the BAAQMD's numeric thresholds. The project will likewise incorporate all of the BAAQMD's basic and enhanced construction mitigation measures (BMPs) as part of the project design. This impact is therefore considered less than significant.

c. **Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

Less than Significant Impact.

BAAQMD has identified project-level thresholds to evaluate criteria pollutant impacts (see Table 4). In developing these thresholds, BAAQMD considered levels at which project emissions would be cumulatively considerable. As noted in their *CEQA Guidelines* (2011):

> In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

The criteria pollutant thresholds presented in Table 4 therefore represent the maximum emissions the project may generate before contributing to a cumulative impact on regional air quality. Consequently, exceedances of the project-level thresholds would be cumulatively considerable. As discussed above,

criteria pollutant emissions associated with implementation of the project are not expected to exceed BAAQMD's quantitative thresholds (see Table 5). This impact would be less than significant.

d. Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact.

Diesel Particulate Matter

Project implementation would generate DPM, resulting in the exposure of nearby existing sensitive receptors (residences) to both project-level and cumulative DPM concentrations.

Diesel-fueled engines, which generate DPM, would be used during sediment, vegetation, and bridge management, as well as during implementation of the other management activities (e.g., roadway repair). BAAQMD considers ultra-fine (PM2.5) particle emissions to be the DPM of greatest health concern. Cancer health risks associated with exposure to diesel exhaust are typically associated with chronic exposure, in which a 70-year exposure period is assumed. In addition, DPM concentrations, and thus cancer health risks, dissipate as a function of distance from the emissions source. BAAQMD has determined that construction activities occurring at distances of greater than 1,000 feet from a sensitive receptor likely do not pose a significant health risk.

As discussed above, residential receptors are adjacent (i.e., within 50 feet) to several potential work areas throughout the SMP Area. DPM generated during implementation of the SMP may expose these receptors to increased health risks. Although project activities at these locations would occur within 1,000 feet of sensitive receptors, use of heavy-duty equipment would be minimal and occur sporadically throughout the year. The majority of project work would be limited to the construction season, which is approximately 4 months per year. As shown in Table 5, maximum daily DPM generated by activities during the construction season would not exceed 2 pounds. These emissions are conservative and assume all equipment would operate at the same time and location. DPM emissions would dissipate as a function of distance and would be lower at the nearest sensitive receptor.

Based on the duration project activities and estimated DPM emissions, implementation of proposed project is neither expected to exceed the BAAQMD risk thresholds nor expose sensitive populations to substantial pollutant concentrations. This impact is considered less than significant.

Carbon Monoxide Hot-Spots

Implementation of the proposed project would not alter or worsen the current congestion (i.e., no changes in level of service) on any streets in the project vicinity (see section VII, Transportation/ Traffic). Likewise, the project would not alter the design of any roadways or generate a significant number of new vehicles trips. Project-related increases in traffic volumes at affected intersections is less than the BAAQMD's (2011) screening criteria of 44,000 vehicles per hour, where a less-than-significant impact to localized CO concentrations would occur for increases in traffic volumes that are below this amount. Accordingly, the project would not contribute to or worsen localized CO concentrations within the study area from increased traffic or congestion associated with the project. This impact would be less than significant.

e. Create objectionable odors?

Less than Significant Impact.

While offensive odors rarely cause any physical harm, they can be unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments

and air districts. Project-related odor emissions would be limited to when emissions from equipment may be evident in the immediately surrounding area. These activities would be intermittent and are not likely to result in nuisance odors that would violate BAAQMD standards. This impact is therefore considered less than significant.

4. BIOLOGICAL RESOURCES

Environmental Setting

The SMP Area is typified by steep to rolling hills declining in slope as they progress toward the Livermore Valley they surround. The Livermore Valley is a moderately sloped to relatively flat valley that drains west ultimately into Alameda Creek and into San Francisco Bay. Elevation of the SMP Area ranges from approximately 300 to 600 feet above mean sea level. The SMP Area supports 188 predominant land cover types, which were identified for the SMP analysis based on the recent East Alameda County Conservation Strategy (EACCS) (ICF International 2010) vegetation community and land cover data in combination with more focused ground-truthing where mapping conflicts were identified. The SMP Area encompasses approximately 789 acres consisting of 12 natural land cover types (alkali meadow and scalds, California annual grassland, mixed riparian forest and woodland, mixed willow riparian scrub, mixed evergreen forest/oak woodland, sycamore alluvial woodland, valley sink scrub, alkali wetland, perennial freshwater marsh, seasonal wetland, pond, and riverine stream) and six non-natural land cover types (vineyard, cropland, ruderal land, golf course/urban park, urban-suburban, and rural residential). Land cover mapping for the SMP is summarized in SMP Table 3-1. See Figures 3-08 through 3-145 in SMP Appendix A for land cover mapping within individual creek and channel reaches.

Each land cover type and associated acreage within the SMP Area is discussed below.

Alkali Meadow and Scalds

Alkali meadow and scald is relatively rare in the SMP Area. It is found on 10 acres, predominantly in the northeast corner of the SMP Area. The most notable areas where this land cover occurs include the Springtown Alkali Sink.

Dominant species in alkali meadows include salt grass (*Distichlis spicata*), wild barley (*Hordeum marinum*), and alkali ryegrass (*Leymus triticoides*). The associated herb cover consists of halophytes, including saltbush (*Atriplex* sp.), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), alkali mallow (*Malvella leprosa*), and common spikeweed (*Centromadia fitchii*). Alkali meadow (alkali grassland) community type is considered a significant natural community by California Natural Diversity Database (CNDDB) because of its rarity and the pressing threats to the remnant communities from land use conversion, invasive species, and changes in hydrologic regime within the watershed. Focal plant species that may be found in this land cover type include San Joaquin spearscale, recurved larkspur, Congdon's tarplant, palmate-bracted bird's-beak, and Livermore Valley tarplant.

California Annual Grassland

California annual grassland occupies an estimated 180 acres of the SMP Area. This land cover type is found throughout the SMP Area. California annual grassland is an herbaceous plant community dominated by nonnative annual grasses (Holland 1986, Sawyer and Keeler-Wolf 1995). In the SMP Area, annual grassland was mapped where grasses and forbs dominate the land cover and where trees and shrubs comprise less than 10% canopy cover. The dominant species are mostly nonnative grasses from the Mediterranean basin, such as soft chess, red brome, wild oats, ripgut brome, and rat-tail fescue). In the spring, many of the annual grasslands are interspersed with a variety of native wildflowers typical of the inner Coast Ranges. Commonly found species of wildflowers in these grasslands include lupine,

fiddleneck, popcornflower, California poppy, owl's clover, and clarkia (Jones & Stokes 2002). In some areas, nonnative weedy vegetation, such as thistles, mustards, and a variety of other weedy forbs, are also common.

Focal plant species that may be found in this land cover type include big tarplant and Congdon's tarplant. Focal wildlife species that could occur in California annual grasslands include California red-legged frog and California tiger salamander. California red-legged frog and California tiger salamander breed in aquatic habitats (e.g., ponds) within grasslands, and use grasslands as movement and underground refugia habitat. Grassland provides potential habitat in the SMP Area for all life stages of the federally endangered Callippe silverspot butterfly could occur within portions of this plant community where its host plant, Johnny jump-up (*Viola pedunculata*), occurs. Several species of birds also use annual grasslands as important foraging habitat.

Mixed Evergreen Forest/Oak Woodland

Mixed evergreen forest/oak woodland occupies an estimated 11 acres of the SMP Area. It is present in discontinuous areas in the southern half of the Planning Area. The largest contiguous stands are near Lake Del Valle, in the south-central part of the Planning Area.

Mixed evergreen forest/oak woodland is characterized by a diverse overstory often dominated by coast live oak. This land cover type contains a mix of co-dominant oaks such as coast live oak, blue oak, and valley oak. The canopy of this land cover type is generally more open and includes some deciduous species. In addition to the array of dominant oaks in this land cover type, a number of both broad-leafed evergreen and deciduous trees are present, including California bay, madrone, California buckeye, and black oak (Holland 1986; Sawyer and Keeler-Wolf 1995). Where shrubby, the understory consists of patches of toyon, poison-oak, and scrub oak. Where more open, the understory typically consists of annual grasses and shade-tolerant perennials, such as yerba santa and common snowberry.

There are no focal species specifically associated with mixed evergreen forest/oak woodland, but focal species typically associated with other habitat types that occur adjacent to mixed evergreen forest/oak woodland could be found within mixed evergreen forest/oak woodland.

Mixed Willow Riparian Scrub

Mixed willow riparian scrub occupies an estimated 33 acres of the total SMP Area. Mixed willow riparian scrub occurs in and along the margins of the active channel on intermittent and perennial streams. In the SMP Area, the most contiguous reach of willow riparian forest and scrub occurs along Arroyo Mocho and along Arroyo del Valle as it passes through Livermore.

In the east Bay Area, streamside habitat dominated by shrubby willows is classified as Central Coast Riparian Scrub (Holland 1986). Although red willow and arroyo willow remain the most common dominant canopy species in this habitat, the name of the land cover has been changed to mixed riparian forest and scrub to better reflect the conditions within the SMP Area. Understory development in willow scrub or forest land cover types is dictated by canopy density. Where the canopy is more open and dominated by trees or scattered willow scrub, an understory of shrubs and herbs is present.

A range of conditions exists among the mixed willow riparian scrub community. Red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), and narrowleaf willow are the dominant canopy species in this habitat. Scrub communities typically consist of scattered willows and mule fat occurring in and along the margins of open sandy washes. Understory development in this land cover type is determined by canopy density.

California red-legged frog utilizes this land cover year-round for breeding and movement, though some of the stream course that pass through urban areas are less suitable. No focal species plants are strictly

associated with riparian forest and scrub land cover types. Riparian corridors in general are important as movement habitat for nearly all terrestrial species. These communities serve to connect the landscape as they move through other land cover types.

Mixed Riparian Forest and Woodland

Mixed riparian forest and woodland occupies approximately 171 acres of the total SMP Area. Mixed riparian forest and woodland is found in association with streams throughout the SMP Area. Stands of this land cover include sections of Arroyo Los Positas and Arroyo Mocho as they pass through Livermore.

Mixed riparian forest and woodland land cover types are similar to willow riparian forests and woodlands in species occurrences. They are found in and along the margins of the active channel on intermittent and perennial streams. Generally, no single species dominates the canopy, and composition varies with elevation, aspect, hydrology, and creek or channel type. The major canopy species throughout the SMP Area are California sycamore, valley oak, coast live oak, red willow, and California bay. Associated trees and shrubs include California black walnut, other species of willow, California buckeye, Fremont cottonwood, and bigleaf maple.

Focal species associated with this land cover type are the same as mixed willow riparian scrub.

Sycamore Alluvial Woodland

Sycamore alluvial woodland is a sensitive natural community and was mapped on 68 acres of the SMP Area. In the SMP Area, this land cover type occurs entirely within the Arroyo del Valle stream reaches.

Sycamore alluvial woodland was readily identified by the large, well-spaced sycamore crowns. In early winter aerial imagery, the large pale branches and halo of fallen golden-yellow leaves were visible. The landscape position, on broad alluvial valley floors, was also indicative of this land cover type.

The sycamore alluvial woodland land cover type is generally present on broad floodplains and terraces along low gradient streams with deep alluvium. Areas mapped as sycamore alluvial woodland are generally open canopy woodlands dominated by California sycamore, often with white alder and willows (*Salix* spp.). Other associated species include bigleaf maple, valley oak, coast live oak, and California bay.

The understory is disturbed by winter flows, and herbaceous vegetation is typically sparse or patchy. Typically, plants such as willows, coyote brush, mule fat, California buckeye, blackberry, Italian thistle, poison-oak, common chickweed and bedstraw populate the streambanks.

Although it occurs along streams, sycamore alluvial woodland undergoes extreme variation in water availability. During the rainy season, the stream channel and adjacent terraces are subject to flooding. During the summer drought, the streams are generally dry, and little moisture is available in the stony substrate. The alluvial substrate contains little soil and is nutrient poor. Flooding also subjects sycamore alluvial forest to frequent disturbance. However, this disturbance appears to benefit regeneration of western sycamores. Regeneration from seed appears to occur in pulses correlated with large flood events (Shanfield 1984). Trees that are damaged by flooding can also resprout from the roots and trunk (Shanfield 1984). Anthracnose, a fungal disease, can defoliate the trees in springtime (Holstein 1984). Heavy cattle grazing may inhibit recruitment of sycamore seedlings, although recruitment may occur under light grazing in favorable (wet) years (Smith 1998).

Focal and CEQA species that may occur in sycamore alluvial woodland include California red-legged frog, western pond turtle, and American badger. California red-legged frog and western pond turtle breed and typically forage in aquatic habitats (e.g., streams) within sycamore alluvial woodland, and use sycamore alluvial woodland as movement and underground refugia habitat. Sycamore alluvial woodland

provides potential movement habitat and, where gopher or ground squirrel colonies exist, foraging habitat in the SMP Area for American badger. Several species of birds also use sycamore alluvial woodlands as important foraging and nesting habitat.

Valley Sink Scrub

Valley sink scrub, also known as alkali sink scrub, was mapped on 20 acres of the SMP Area. It generally occurs in the northern half of the SMP Area, most notably in the Springtown Alkali Sink just northeast of Livermore. Valley sink scrub could also occur in any of the locations mapped as alkali meadow and scald, and the land cover should be mapped at the parcel scale during project review.

This community develops where clay-rich alkaline soils are seasonally saturated because of a shallow water table, low surface runoff, and slow infiltration (Bittman 1985). Valley sink scrub is rare compared with its historical extent, and most of the remaining occurrences are highly degraded (U.S. Fish and Wildlife Service 1998). This habitat is considered sensitive by CDFW (California Natural Diversity Database 2009).

Valley sink scrub is dominated by a discontinuous shrub layer of iodine bush and alkali seepweed. The herbaceous layer consists of a patchwork of barren, salt-encrusted scalds and alkali grassland vegetation. Focal plant species that may occur in valley sink scrub include San Joaquin spearscale, palmate-bracted bird's beak, and Livermore Valley tarplant. California red-legged frog and California tiger salamander may use valley sink scrub for upland habitat or as habitat or for movement corridors.

Alkali Wetland

Within the SMP Area, alkali wetlands occupy an estimated 14 acres of the total SMP Area. These wetlands occur primarily in the northern half of the SMP Area, particularly along creeks and channels where alkali soils occur. A larger alkali wetland complex occurs in the Springtown Alkali Sink north of Livermore, and more details are provided for the Springtown Alkali Sink below. Alkali wetlands support ponded or saturated soil conditions and occur as perennial or seasonally wet features on alkali soils. Alkali wetlands were mapped where wetlands occurred in association with alkali soils.

The vegetation of alkali wetlands is composed of halophytic plant species adapted to both wetland conditions and high salinity levels. Typical species include those common to both seasonal and alkali wetlands, such as salt grass, alkali heath, and common spikeweed.

Alkali wetlands provide function and value for wildlife similar to those provided by seasonal wetlands. The array of wildlife species found in seasonal wetlands is also found in alkali wetlands. See the section below on the Springtown Alkali Sink for more details.

Springtown Alkali Sink

The Springtown Alkali Sink is a biologically unique area that supports several state- and federally listed plant and wildlife species (Kohlmann et al. 2008). It encompasses approximately 1,150 acres at the northern edge of the city of Livermore and adjacent Alameda County. The sink is a topographic depression in which salts have concentrated; these salts, and the unique and complex surface and groundwater hydrology of the region, support an unusually high diversity and density of sensitive biotic communities and special-status species.

Boundary of the Sink

Historically, Springtown Alkali Sink occupied an irregularly shaped area of more than 3,000 acres. The historical boundaries of the sink can be determined through historical aerial photos and the extent of the saline-alkaline soils (Soil Conservation Service 1966; Coats et al. 1988). The sink formerly extended west

to the intersection of Hartford Avenue and North Livermore Avenue, east to Frick Lake, south almost to I-580, and north almost to the "May School Road" line (a line formed by extending May School Road to the east).

The extent of the sink has been greatly reduced by residential development in the south and agricultural operations in the north. High-quality habitats are currently found in two disjunct areas on either side of Vasco Road. This boundary is based largely on the extent of saline-alkaline soils of the Pescadero and Solano soil series, which indicates the historical extent of the sink. The larger of the two areas of the sink stretches from Ames Road in the east to North Livermore Avenue in the west. This area also includes a small watershed upstream of the intersection of Raymond Road and Ames Street that contains saline-alkaline soils and special-status species, and supports the hydrology of the sink. East of Vasco Road, the sink includes a high density of wetlands and special-status species, and the saline-alkaline soils along Brushy Peal Tributary. The most prominent feature in this area is Frick Lake, the only large saline vernal pool known to exist in the county.

Hydrology of the Sink

The sink is influenced by both surface and groundwater flows into the basin from fresh and saline sources. Surface flows to the sink come from seven south- and southwest-draining subbasins (Jones & Stokes 2003). The largest subbasins are those containing Brushy Peak Tributary and Altamont Creek; these contribute saline-alkaline flows from the east and northeast. The remaining six subbasins are considerably smaller than the Brushy Peak-Altamont Creek subbasin. In the past, the Brushy Peak-Altamont Creek subbasin contributed by far the largest proportion of surface water and groundwater entering the sink's wetland and saline-alkaline habitats (Coats et al. 1988; Phillip Williams & Associates 1988; Questa Engineering Corporation 1998). Because of significant modifications to Altamont Creek and grading related to residential development, a greater proportion of the surface water and groundwater entering the sink's lowland habitats now comes from subbasins to the north and northwest, particularly the subbasin that contains North Livermore Avenue (Questa Engineering Corporation 1998).

At present, the most prominent hydrologic feature in the sink is Frick Lake, located in the area's northeastern corner. Frick Lake is a seasonally ponded basin that covers about 24 acres at high water. The lake is primarily fed by incidental precipitation and by runoff from rangelands to the east. Minor amounts of runoff also enter the lake from the north and south. Vegetation surrounding the lake suggests that its water is saline. Neither the chemistry nor the origin of the lake has been studied to date. Frick Lake may have formed as uplift along the Greenville Fault blocked westward-flowing drainages at the rangefront, pooling water behind a local topographic high; although Laughlin Road follows the west margin of the lake, it was likely built on an existing elevated surface and does not appear to confine the lake.

The sink also contains a high density of seasonal wetlands and vernal pools. These pools fill with water in the winter and slowly dry during spring. The pools are formed in depressions within a mosaic of "hogwallow" or "mima mound" topography. The pools are fed by surface runoff in the complex microtopography and small channels that wind through the sink. These pools support a high diversity of aquatic and semi aquatic organisms, as described below.

The sink also receives significant influx of salts and flows just below the surface in a shallow groundwater layer. This shallow layer occurs from the surface to between 6 and 10 feet deep, above a semi-confining claypan/hardpan (Phillip Williams & Associates 1988; Questa Engineering Corporation 1998). Near the surface, groundwater flows into the sink through buried channels that may have been historical creeks. These subsurface channels enter the sink from the northwest, north, and northeast. Although not well studied, they appear to extend as far west as North Livermore Avenue, as far north as Manning Road, and as far east as Laughlin Road (Questa Engineering Corporation 1998). These subsurface channels appear to play a major role in water budget and salt balance of the sink (Lamphier & Associates and SWA

Group 2000), and point to the importance of preserving the groundwater hydrology within the larger watersheds of the sink.

Biotic Communities of the Sink

Biotic communities within the sink consist of valley sink scrub, alkali grassland, and California annual grassland. All three of those land cover types are described above.

Special-Status Species of the Sink

The sink is unique, in part, because of its concentration of special-status species. Probably the most unique of these species is palmate-bracted bird's beak, listed as endangered under the ESA and CESA. Other special-status plant species that occur in the sink include brittlescale, San Joaquin spearscale, hispid bird's-beak, and Livermore Valley tarplant. Special-status wildlife species known to occur in the sink include California red-legged frog, California tiger salamander, vernal pool fairy shrimp, and western burrowing owl. San Joaquin kit fox may occasionally use the eastern portion of the sink.

Perennial Freshwater Marsh

Within the SMP Area, perennial freshwater marsh occupies an estimated 11 acres of the total SMP Area. Perennial freshwater marsh is likely to have been underestimated in the EACCS land cover mapping due to the small size of these features and the difficulty of distinguishing marsh from the surrounding grassland on the spring aerial photos. Some perennial freshwater marsh is also difficult to distinguish from seasonal wetland during winter. Dominant species in perennial freshwater wetland in the SMP Area include rabbitsfoot grass, nutsedge, willow weed, and watercress.

Perennial freshwater marsh is dominated by emergent herbaceous plants (reeds, sedges, grasses) with either intermittent flooded or perennially saturated soils. Freshwater marshes are found throughout the coastal drainages of California wherever water slows down and accumulates, even on a temporary or seasonal basis. A freshwater marsh usually features shallow water that is often clogged with dense masses of vegetation, resulting in deep peaty soils. Plant species common to coastal and valley freshwater marsh predominantly consist of cattails, bulrushes, sedges, and rushes. Dominant species in perennial freshwater wetland in the SMP Area include rabbitsfoot grass, nutsedge, willow weed, and watercress. Dominant species in non-tidal freshwater marsh are narrow-leaved cattail, rice cutgrass, bur-reed, alkali bulrush, and perennial peppergrass.

Focal species that may be found breeding in the perennial freshwater marsh land cover type include California red-legged frog and California tiger salamander.

Seasonal Wetland

Within the SMP Area, seasonal wetlands occupy an estimated 22 acres of the total SMP Area. Seasonal wetlands occur in association with riparian land cover along Arroyo Las Positas. This land cover type often occurs adjacent to alkali wetland. These two land cover types were differentiated based on the underlying soils in the EACCS land cover mapping. Seasonal wetlands are likely underrepresented in the land cover map because of their typically small size and isolated locations, and difficulty in interpreting the photographic signature of individual features. However, large seasonal wetland complexes (i.e., groups of many small pools or wetlands) were easily visible on aerial photos.

Seasonal wetlands are freshwater wetlands that support ponded or saturated soil conditions during winter and spring and are dry through the summer and fall until the first substantial rainfall. The vegetation is composed of wetland generalists, such as hyssop loosestrife, cocklebur, and Italian ryegrass that typically occur in frequently disturbed sites, such as along streams. Common species in seasonal wetlands within

the SMP Area include watercress (*Rorippa* spp.), water speedwell, and smartweeds (Jones & Stokes 2001).

Pond

Ponds occupy approximately 2 acres of the SMP Area. Ponds are important habitat networks that facilitate species movement and increase breeding diversity. Ponds are small perennial or seasonal water bodies with little or no vegetation. If vegetation is present, it is typically submerged or floating. Ponds may occur naturally or may be created or expanded for livestock use (stock ponds).

The majority of the ponds in the SMP Area are most often stock ponds that provide water to grazing livestock. Lands historically used for grazing, but currently protected as open space, also contain historical stock ponds in disrepair that may be a result of not using grazing as a management tool. Plants often associated with ponds include floating plants such as duckweed (*Lemna* spp.) or rooted plants such as cattails, bulrushes, sedges, rushes, watercress, and water primrose. Stock ponds are often surrounded by pasture with grazing livestock. Immediately adjacent to the stock pond, soil may be exposed due to the continued presence of livestock. Stock ponds without grazing may be overgrown and surrounded by wetland vegetation including willows, cattails, reeds, bulrushes, sedges (*Cyperus* spp.), thus reducing habitat value for wildlife.

Focal species that use ponds during all or part of the year include California tiger salamander and California red-legged frog. These species rely on ponds for breeding sites. No focal plants are associated with ponds.

Riverine Stream

The stream land cover type covers 43 linear miles and 41 acres within the SMP Area. Major streams in the SMP Area include Arroyo del Valle, Arroyo Mocho and Arroyo Las Positas, and Altamont Creek. Streams can be unvegetated along their banks or support various types of riparian vegetation. Streams that support riparian vegetation were categorized into one of the three riparian land cover types. For a complete picture of the extent of streams in the SMP Area the stream and riparian land covers described previously should be considered together.

The stream land cover type includes perennial, intermittent, and ephemeral watercourses characterized by a defined bed and bank. Perennial streams support flowing water year-round in normal rainfall years. These streams are often marked on USGS quadrangle maps with a blue line, and are known as *blue-line streams*. In the semiarid Mediterranean climate of the SMP Area with its wet and dry seasons, perennial streamflows are enhanced in the dry season through groundwater aquifer contributions, flows from shallower springs/seeps, and reservoir releases. Intermittent (seasonal) streams carry water though most of the wet season (November–April) and are dry through most or all of the dry season (May–October) in a normal rainfall year. More specifically, in the wet season, intermittent streamflow occurs when the water table is raised, or rejuvenated, following early season rains that fill shallow subsurface aquifers. Intermittent flows can also be considered as the base flows between storm events that continue on through much of the winter season. Ephemeral streams carry water only during or immediately following a rainfall event. All streams are jurisdictional if they have a defined bed and bank (refer to regulatory descriptions in Chapter 2).

The creek or channel land cover type is most closely associated with riparian plants (see the "Riparian Forest and Scrub" section above for discussion of riparian land cover types). The riparian plant composition and width of the riparian corridor vary depending on channel slope, magnitude and frequency of channel and overbank flows, and the frequency/duration of flooding flows that inundate the broader floodplain. Willows may become established in-channel in areas of sediment deposition, unless

suppressed by intensive grazing. Woody debris, such as fallen trees that are submerged in streams, provides good habitat and shelter for fish and aquatic invertebrates.

Stream systems provide habitat for aquatic macroinvertebrates, which are an important food source for local and downstream populations of fish, birds, and other animals. Further downstream outside of the SMP Area, below the flood control drop structure (Bay Area Rapid Transit weir) adjacent to the Quarry Lakes Regional Recreation Area, central California coast steelhead and Central Valley fall-run Chinook salmon have been observed. Central California coast steelhead use streams with suitable depths, velocities, and temperatures for juvenile rearing and feeding. Juvenile Central Valley fall-run Chinook salmon use the margins of rivers and streams after emerging from gravels to feed. They also use overhanging vegetation and substrate for cover. Focal species that rely on stream land cover include California red-legged frog.

Vineyard

Vineyards occupy approximately 1 acre of the SMP Area. Vineyards are mostly located south of Livermore, though some vineyard development is also starting north of Livermore. Vineyard development in natural habitats substantially degrades wildlife habitat. Some focal species are sometimes observed in vineyards (e.g., foraging and movement). In some areas, nonnative weedy vegetation, such as thistles, mustards, and a variety of other weedy forbs, may be found.

Cropland

Cropland is the most common of the farmland land cover types in the low-lying areas of the SMP Area, occupying 12 acres. Croplands are abundant throughout the Livermore Valley north and south of the city of Livermore.

Row-crops are those areas tilled and cultivated for agricultural crops such as corn, grain, strawberries, peppers, and pumpkins. These row-crops can also be converted to other agricultural uses. *Fallow fields* include fields that were not in production at the time of aerial photos, but may be utilized for grain, row-crops, and hay and pasture in subsequent years.

Hay and pasture include both dryland settings and irrigated areas. The key difference between hay production and pasture is that crops are harvested onsite and consumed offsite (hay is also cut, bailed, and trucked offsite), whereas pasture is consumed by livestock onsite. Common vegetation includes fast-growing forage grasses, such as wild oats and Italian ryegrass, as well as irrigated legumes such as alfalfa, sweet clover, and true clover. In some areas, nonnative weedy vegetation, such as thistles, mustards, and a variety of other weedy forbs, are also common.

Focal species expected to be found in this land cover type are tricolored blackbird, western burrowing owl, Callippe silverspot butterfly, and golden eagle, all of which forage in grain crops and pastures. Western burrowing owls may also breed in agricultural settings if ground squirrel burrows are present. San Joaquin kit fox may move through this land cover type if it occurs near suitable grassland areas. California tiger salamander and California red-legged frog disperse through croplands to reach suitable breeding and upland habitat.

Ruderal Land

This land cover type occupies 19 acres in the SMP Area and generally occurs on the edges of or within developed areas. Areas mapped as ruderal are disturbed areas characterized by sparse nonnative, typically weedy vegetation. Most ruderal areas are vacant parcels surrounded by developed areas. Some areas mapped as ruderal may actually be cropland that has been left fallow for a year or more. Ruderal areas that have not experienced substantial disturbance (e.g., disking) for a number of years may develop into annual grasslands.

Where vegetation is present, ruderal land cover is dominated by a mixture of nonnative annual grasses and weedy species, such as black mustard, thistles, and wild radish, that tend to colonize quickly after disturbance. Wildlife common to ruderal habitats can include species closely associated with urban development, such as house sparrow, European starling, rock dove, western scrub-jay, black-tailed jackrabbit, raccoon, opossum, striped skunk, and house mouse. Focal species such as the western burrowing owl often use ruderal habitats in the Bay Area for both nesting and overwintering habitat. However, ruderal habitats frequently become overgrown with vegetation, which becomes fire-prone, dense, matted, and uninhabitable for wildlife species.

Golf Course/Urban Park

Urban parks and golf courses comprise 23 acres of the SMP Area. Urban parks and golf courses are located throughout the urbanized areas of the SMP Area.

Golf courses and urban parks are composed predominantly of nonnative vegetation and provide limited habitat for native wildlife. Urban parks are unlikely to support any focal species. Golf courses on the fringe of urban areas may support California tiger salamander, California red-legged frog, western burrowing owl, or tricolored blackbird, particularly if ponds are present on or near the golf course; however, habitat quality in and around golf courses is typically of lower quality because golf course apply fertilizers and other chemical treatments that may run off into waterways and onto adjacent lands during rain events.

Urban-Suburban

Urban-suburban areas comprise 145 acres of the SMP Area. The urban-suburban land cover comprises areas where the native vegetation has been cleared for residential, commercial, industrial, transportation, or recreational structures, and is defined as one or more structures per 2.5 acres. These include areas that have structures, paved and impermeable surfaces, horticultural plantings, and lawns smaller than 10 acres (irrigated lawns larger than 10 acres were mapped as urban parks).

Vegetation found in the urban-suburban land cover type is usually in the form of landscaped residences, planted street trees (i.e., elm, ash, liquidambar, pine, palm), and parklands. Most of the vegetation is composed of nonnative or cultivated plant species.

It is less likely that focal species would be found in urban-suburban areas. The exception would be western burrowing owl, which sometimes thrives in suburban areas that have been cleared for development (prior to development occurring). In addition, the alkali wetlands that occur in north Livermore (adjacent to urban development) support may alkali wetland species, including the palmate-bracted bird's beak.

Rural Residential

Rural residential areas comprise just less than 6 acres of the SMP Area. Rural residential areas are mainly located in the foothills that surround the City.

The rural residential land cover type is similar to the urban-suburban type except that it is typically much less dense (defined as less than one structure per 2.5 acres) and usually contains extensive landscaping and/or irrigated lands (including small areas of pasture).

Several covered species may be found in rural residential areas. Mobile species such as golden eagle, western burrowing owl, tricolored blackbird, San Joaquin kit fox, or American badger may move through rural residential land cover if it occurs adjacent to or near natural habitat. Similarly, California tiger salamander may utilize areas that have open grasslands and are near suitable breeding sites. Callippe silverspot butterfly will move through rural residential areas to disperse between patches of grassland.

Impact Analysis

Would the proposal:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less than Significant with SMP BMPs and SMP Mitigation.

Special-Status Species

Special-status species are plants and animals that are legally protected under the California Endangered Species Act (CESA), the federal Endangered Species Act (ESA), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing.

The potential for occurrence of special-status plants and wildlife species within or adjacent to SMP creeks and channels was based on the results of research, observations, and habitat distribution modeling completed for EACCS (ICF International 2010) combined with the proximity of California Natural Diversity Database (California Natural Diversity Database 2015) records for covered species and species-specific habitat requirements. The EACCS habitat distribution models were developed for select EACCS focal species to predict where species addressed by EACCS are most likely to occur based on known habitat requirements. Habitat distribution models were developed on a regional scale using regional data. The models were intended for use in regional planning and do not necessarily provide accurate site-specific species information. CNDDB data were used to determine the likelihood that the corresponding species would occur within suitable habitat in the SMP Area. For the purposes of the biological resources section, the species study area is defined as all areas within 5 miles of the SMP Area and primarily pertains to CNDDB records. Site-specific conditions will be field-verified as part of the SMP annual work plan prior to completion of maintenance activities.

Program activity locations were provided by the City of Livermore, digitized into GIS by ICF International, and overlaid on the habitat modeling data to determine the extent and location of habitat impacts. These impacts were then compared to species' habitat requirements and the likelihood for each species to occur within habitat that would be impacted by SMP activities at each reach.

The results of the analysis indicate that Program activities will impact special-status species habitat. Therefore, Project activities have the potential to directly impact special-status species potentially resulting in mortality, harm, increased stress, loss of young, and reduced population fitness. The primary Program activities include sediment management, vegetation management, and bank stabilization associated with maintenance of creeks and channels within the SMP Area. Other program activities consist of bridge maintenance, culvert repair and replacement, irrigation system maintenance, trash and debris removal, and access road and trail maintenance. The nature of potential impacts is discussed in the following sections by plant and wildlife species.

The approach for implementing species mitigation and associated ratios is described at the end of the Checklist topic "a" discussion under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation Strategy*.

Special-Status Plants

Project activities have the potential to adversely affect San Joaquin spearscale (*Atriplex joaquiniana*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), Palmate-bracted bird's-beak (*Cordylanthus palmatus*), and Livermore tarplant (*Deinandra bacigalupii*).

*San Joaquin Spearscale (*Atriplex joaquinlana*)*

San Joaquin spearscale typically occurs in alkali grassland and alkali meadow, or on the margins of alkali scrub. For this analysis, suitable habitat is assumed to exist on all alkali wetland and alkali meadow and scalds land cover types. There are 16 documented occurrences of San Joaquin spearscale in the species study area (California Natural Diversity Database 2015). Suitable habitat for this species in the SMP Area includes portions of Arroyo Las Positas and Altamont Creek in the northeast end of the City, and near the confluence of Arroyo Las Positas and Cayetano Creek. Based on low habitat quality and the SMP Area's proximity to extant occurrences, potential for occurrence of San Joaquin spearscale is possible but considered low.

The SMP estimates that 24 acres (14 acres of alkali wetland and 10 acres of alkali meadow and scalds) of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 3 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-23). As described above, the amount of permanent vs. temporary impact depends not only on the type of activity being implemented, but also on site-specific maintenance needs. For example, not all bank stabilizations require use of hardscape (e.g., rip-rap) features (which would be a permanent impact). Furthermore, this species is not expected to occupy all suitable habitat; rather, it is expected to occur in sparse patches within suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. Therefore, the potential for this species to be impacted is low, but possible. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to San Joaquin spearscale (see BMP BR-7 in SMP Table 7-1). This BMP requires that appropriately-timed surveys for this species will occur in suitable habitat (alkali wetland and alkali meadow and scalds) prior to the initiation of Program activities. If encountered, and where feasible, the project would be re-designed to avoid the occurrence. If avoidance is possible, individuals or groups of individuals would be avoided through the installation of stakes, flags, and high-visibility fencing around the species' location. If plant occurrences are located in wetlands, silt fencing will also be installed. Species location will also be included on maintenance design drawings, if applicable. The maintenance design drawings will also include language that prohibits maintenance-related activities, vehicle operation, material and equipment storage, and other surface disturbing activities within the fenced area. If impacts cannot be avoided, then enhancement of occupied habitat and/or expansion adjacent to occupied habitat will occur. The compensation site(s) will be monitored for success and will undergo invasive species control. The transplantation/propagation plan will include contingency measures, such as replanting, to ensure successful compensation. With the implementation of BMP BR-7, impacts to these species would be less than significant.

*Congdon's Tarplant (*Centromadia parryi *ssp. congdonii)*

Congdon's tarplant typically occurs in annual grassland on lower slopes, flats, and swales below 800 feet. This species can be associated with alkaline or saline soils. There are 15 documented occurrences of Congdon's tarplant within the species study area (California Natural Diversity Database 2013). For this analysis, suitable habitat is assumed to exist on California annual grassland land cover types. Within the SMP Area, potentially suitable habitat for this species occurs in the vicinity of the Cottonwood Creek and Collier Canyon Creek. Based on habitat quality and the SMP's proximity to extant occurrences, potential for occurrence of Congdon's tarplant is possible but considered low.

The SMP estimates that 180 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, less than 1 acre (near Cottonwood Creek and Collier Canyon Creek) of suitable habitat could be affected by the implementation of SMP activities (see SMP Table 6-23). This species is not expected

to occupy all suitable habitat; rather, it is expected to occur in sparse patches within suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. Therefore, the potential for this species to be impacted is low, but possible. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to Congdon's tarplant (see BMP BR-7 in SMP Table 7-1). This BMP requires that appropriately-timed surveys for this species will occur in suitable habitat (California annual grassland) prior to the initiation of Program activities. If encountered, and where feasible, the project would be re-designed to avoid the occurrence. If avoidance is possible, individuals or groups of individuals would be avoided through the installation of stakes, flags, and high-visibility fencing around the species' location. If plant occurrences are located in swales or near wetlands, silt fencing will also be installed. Species location will also be included on maintenance design drawings, if applicable. The maintenance design drawings will also include language that prohibits maintenance-related activities, vehicle operation, material and equipment storage, and other surface disturbing activities within the fenced area. If impacts cannot be avoided, then compensation (transplantation or propagation) in unoccupied, suitable habitat will occur based on a transplantation/propagation plan. The compensation site(s) will be monitored for success and will undergo invasive species control. The transplantation/propagation plan will include contingency measures, such as replanting, to ensure successful compensation. With the implementation of BMP BR-7, impacts to the species would be less than significant.

*Palmate-bracted Bird's-beak (*Cordylanthus palmatus*)*

Palmate-bracted bird's-beak is associated with alkaline sites in grassland and chenopod scrub from 10-500 feet elevation. For this analysis, suitable habitat is assumed to exist in the alkali wetland, alkali meadow and scalds, valley sink scrub, and riverine stream land cover types. One occurrence of Palmate-bracted bird's-beak has been reported in the species study area, located northeast of Livermore in the Springtown Alkali Sink Preserve (California Natural Diversity Database 2013). Potentially suitable habitat for this species occurs along Altamont Creek at its confluence with Arroyo Las Positas, on the Arroyo Las Positas Tributary, and along the Basins. Potential habitat in the riverine stream land cover type only occurs in the Springtown area (Arroyo Las Positas, Altamont Creek, Arroyo Las Positas Tributary, and Basins). Based on habitat quality and the SMP's proximity to extant occurrences, potential for occurrence of Palmate-bracted bird's beak is possible but considered low.

The SMP estimates that 44 acres of alkali wetland, alkali meadow and scalds, and valley sink scrub, and 41 acres of riverine stream, exists in the SMP Area. Of this, up to 5 acres of alkali wetland, alkali meadow and scalds, and valley sink scrub, and 2 acres of riverine stream in the Springtown area could be impacted by implementation of SMP activities (see SMP Table 6-23). This species is not expected to occupy all suitable habitat; rather, it is expected to occur in sparse patches within suitable habitat. Thus, the estimated impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. Therefore, the potential for this species to be impacted is low, but possible. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to Palmate-bracted bird's beak (see BMP BR-7 in SMP Table 7-1). This BMP requires that appropriately-timed surveys for this species will occur in suitable habitat (alkali wetland and alkali meadow and scalds, valley sink scrub, and riverine stream in the Springtown area) prior to the initiation of Program activities. If encountered, and where feasible, the project would be re-designed to avoid the occurrence. If avoidance is possible, individuals or groups of individuals would be avoided through the installation of stakes, flags, and high-visibility fencing around the species' location. If plant occurrences are located in wetlands, silt fencing will also be installed. Species location will also be included on maintenance design drawings, if applicable. The maintenance design drawings will also include language that prohibits

maintenance-related activities, vehicle operation, material and equipment storage, and other surface disturbing activities within the fenced area. If impacts cannot be avoided, then enhancement of occupied habitat and/or expansion adjacent to occupied habitat will occur. The compensation site(s) will be monitored for success and will undergo invasive species control. The transplantation/propagation plan will include contingency measures, such as replanting, to ensure successful compensation. With the implementation of BMP BR-7, impacts to the species would be less than significant.

*Livermore Tarplant (*Deinandra bacigalupii)

Livermore tarplant occurs in seeps and meadows, often associated with alkali meadows at 500–600 feet in elevation. For this analysis, suitable habitat is assumed to exist in all alkali wetland and alkali meadow and scalds land cover types. This species has not been identified within the species study area (California Natural Diversity Database 2015); however, three occurrences are located northeast of Livermore in the foothills of the Diablo Range (ICF International 2010). Suitable habitat for this species in the SMP Area includes portions of Altamont Creek, Altamont Creek Tributary, Arroyo Las Positas, and in the isolated reach of Baer Creek Basin. Based on habitat quality and the SMP's proximity to extant occurrences, potential for occurrence of Livermore tarplant is considered low, but possible. Given the limited extent of potentially suitable habitat within the SMP Area, it is not likely that program-related activities will impact habitat for this species. Surveys for this species will occur in appropriate habitats as part of the site reconnaissance during annual work plan development to determine presence or absence.

The SMP estimates that 24 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 3 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-23). This species is not expected to occupy all suitable habitat; rather, it is expected to occur in sparse patches within suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. Therefore, the potential for this species to be impacted is low, but possible. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to Livermore tarplant (see BMP BR-7 in SMP Table 7-1). This BMP requires that appropriately-timed surveys for this species will occur in suitable habitat (alkali wetland and alkali meadow and scalds) prior to the initiation of Program activities. If encountered, and where feasible, the project would be re-designed to avoid the occurrence. If avoidance is possible, individuals or groups of individuals would be avoided through the installation of stakes, flags, and high-visibility fencing around the species' location. If plant occurrences are located in wetlands, silt fencing will also be installed. Species location will also be included on maintenance design drawings, if applicable. The maintenance design drawings will also include language that prohibits maintenance-related activities, vehicle operation, material and equipment storage, and other surface disturbing activities within the fenced area. If impacts cannot be avoided, then compensation (transplantation or propagation) in unoccupied, suitable habitat will occur based on a transplantation/propagation plan. The compensation site(s) will be monitored for success and will undergo invasive species control. The transplantation/propagation plan will include contingency measures, such as replanting, to ensure successful compensation. With the implementation of BMP BR-7, impacts to the species would be less than significant.

Special-Status Wildlife

Project activities have the potential to adversely affect longhorn fairy shrimp(*Branchinecta longiantenna*), vernal pool fairy shrimp (*Branchinecta lynchi*), Callippe silverspot butterfly (*Speyeria callippe callippe*), California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), western pond turtle (*Emys marmorata*), golden eagle (*Aquila chrysaetos*), tricolored

blackbird (*Agelaius tricolor*), western burrowing owl (*Athene cunicularia hypugea*), San Joaquin kit fox (*Vulpes macrotis mutica*), and American badger (*Taxidea taxus*).

The potential to impact Alameda whipsnake (*Masticophis lateralis euryxanthus*) and foothill yellow-legged frog (*Rana boylii*) was considered, but no overlap in potential habitat and SMP activities were identified for these species. As such, these species are not discussed further.

*Longhorn Fairy Shrimp (*Branchinecta longiantenna*)*

Longhorn fairy shrimp occurrences are rare and highly disjunct with specific pool characteristics largely unknown (U.S. Fish and Wildlife Service 2003). Typical habitat for listed fairy shrimp in California include vernal pools, seasonally ponded areas within vernal swales, ephemeral freshwater habitats and artificial habitats (railroad toe-drains, roadside ditches, abandoned agricultural drains, ruts left by heavy construction vehicles, and depressions in firebreaks) (Eng et al. 1990; U.S. Fish and Wildlife Service 2003) Vernal pools are subject to seasonal variations, and vernal pool fairy shrimp are dependent on the ecological characteristics of those variations. These characteristics include duration of inundation and presence or absence of water at specific times of the year (U.S. Fish and Wildlife Service 1994). For this analysis, longhorn fairy shrimp is assumed to exist on all seasonal wetland land cover types. There is are three documented occurrences of longhorn fairy shrimp in the species study area east and north of Brushy Creek Preserve in eastern Alameda and Contra Costa Counties (California Natural Diversity Database 2015).Seasonal wetland habitat in the SMP Area includes portions of Altamont Creek, Altamont Creek Tributary, Arroyo Las Positas, Arroyo Seco, Collier Canyon Creek, Cottonwood Creek, and an isolated reach in Bear Creek Basin. Based on habitat quality and the SMP Area's proximity to extant occurrences, potential for occurrence of vernal pool fairy shrimp is considered very low.

The SMP estimates that 32 acres of suitable habitat (alkali meadow and scald, alkali wetland, and seasonal wetland) exists in the SMP Area (see SMP Table 3-1). Of this, up to 7 acres of seasonal wetlands could be affected by implementation of SMP activities (see SMP Table 6-14). However, this species is not expected to occupy all suitable habitat; rather, it is expected to occur in portions of available suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. Therefore, the potential for this species to be impacted is low, but possible. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to longhorn fairy shrimp (see BMP BR-15 in SMP Table 7-1). This BMP requires avoidance of all vernal pools to the extent feasible. If vernal pools, clay flats, alkaline pools, ephemeral stock tanks, or sandstone pools, or roadside ditches are present, a qualified biologist will stake or flag an exclusion zone prior to construction activities. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew). The exclusion zone will encompass the maximum practicable distance from the worksite and at least 250 feet from the aquatic feature wet or dry. The hydrology feeding into exclusion zones shall not be modified or changed.

Where project activities would affect longhorn fairy shrimp habitat (that is presumed to be occupied), SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation*. With the implementation of BMP BR-15 and SMP mitigation required, potential impacts to the species would be less than significant.

*Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)*

The vernal pool fairy shrimp is usually associated with vernal pools, but can also be found in other ephemeral habitats including alkali pools, seasonal drainages, stock ponds, vernal swales, rock

outcrops and artificially created ephemeral habitats (railroad toe-drains, roadside ditches, abandoned agricultural drains, ruts left by heavy construction vehicles, and depressions in firebreaks) (Eng et al. 1990, Vollmar 2002). Vernal pools are subject to seasonal variations, and vernal pool fairy shrimp are dependent on the ecological characteristics of those variations. These characteristics include duration of inundation and presence or absence of water at specific times of the year (U.S. Fish and Wildlife Service 1994). The vernal pool fairy shrimp is capable of living in Central Valley vernal pools of relatively short duration (pond 6 to 7 weeks in winter and 3 weeks in spring) (Eriksen and Belk 1999). For this analysis, it is assumed to exist on all seasonal wetland land cover types. There are four CNDDB occurrence records for this species in the species study area: at the Springtown Natural Communities Reserve near Livermore, in an alkali sink containing vernal pools; in a seasonal wetland with an annual grassland upland, north of Interstate 580 near Livermore; south of Frick Lake, in a heavily grazed pasture; and north of the Brushy Peak Preserve in southeastern Contra Costa County (California Natural Diversity Database 2015). Vernal pool fairy shrimp may also be found elsewhere throughout the study area in vernal pool habitats. The lack of data points could be due to a lack of survey effort. Suitable habitat for this species in the SMP Area includes portions of Altamont Creek, Altamont Creek Tributary, Arroyo Las Positas, Arroyo Seco, Collier Canyon Creek, Cottonwood Creek, and an isolated reach in Bear Creek Basin. Based on habitat quality for this species and the SMP Area's proximity to extant occurrences, potential for occurrence of vernal pool fairy shrimp is possible.

The SMP estimates that 32 acres of suitable habitat (alkali meadow and scald, alkali wetland, and seasonal wetland) exists in the SMP Area (see SMP Table 3-1). Of this, up to 7 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-14). However, this species is not expected to occupy all suitable habitat; rather, it is expected to occur in portions of available suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. Nonetheless, impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to vernal pool fairy shrimp (see BMP BR-15 in SMP Table 7-1). This BMP requires avoidance of all vernal pools to the extent feasible. If vernal pools, clay flats, alkaline pools, ephemeral stock tanks, or sandstone pools, or roadside ditches are present, a qualified biologist will stake or flag an exclusion zone prior to construction activities. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew). The exclusion zone will encompass the maximum practicable distance from the worksite and at least 250 feet from the aquatic feature wet or dry. The hydrology feeding into exclusion zones shall not be modified or changed.

Where project activities would affect vernal pool fairy shrimp habitat (that is presumed to be occupied), mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation.* With the implementation of BMP BR-15 and SMP mitigation, potential impacts to this species would be less than significant.

Callippe Silverspot Butterfly (Speyeria callippe callippe)

The Callippe silverspot butterfly occurs in grasslands where its sole larval food plant, Johnny jump-up (*Viola pedunculata*), grows. It has been observed in both grazed and ungrazed grasslands. The Callippe silverspot butterfly occurs in hilly terrain with a mixture of topographic relief. Adults will visit the margins of oak woodlands and riparian areas in search of nectar, as well as disturbed areas if favored nectar plants grow there. For this analysis, suitable habitat is assumed to exist in all California annual grassland. There are no CNDDB occurrences in the species study area (California Natural Diversity Database 2015), but potentially suitable habitat occurs north of Interstate 580, along Arroyo Las Positas, along Arroyo Las Positas Tributary, and along portions of Altamont Creek. Program maintenance activities within creeks and channels are not expected to result in effects to

Callippe silverspot butterflies because this is not their preferred habitat. Based on low habitat quality where the SMP activities will be taking place and the lack of occurrences in proximity to the SMP Area, potential for occurrence of Callippe Silverspot butterfly is possible, but considered very low.

The SMP estimates that 180 acres of suitable habitat (California annual grassland) exists in the SMP Area (see Table 3-1). Of this 23 acres could be affected by the implementation of SMP activities (see SMP Table 6-15). Staging areas that occur in upland grasslands could potentially impact this species; however, the potential for occurrence is low due to a lack of recorded observations in east Alameda County. Nevertheless, such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to Callippe silverspot butterfly (see BMP BR-16 in SMP Table 7-1). This BMP prohibits herbicide application within 100 feet of host plant populations (as identified during pre-activity survey also required by the SMP BMPs). Spot application to cut stumps, frilled stems, or injected into stems are acceptable, but no broadcast applications will be permitted. Cut trees that are removed in the vicinity of host plants (Johnny jump-ups) will be carried out as opposed to dragged to the disposal area and removal of any host plant will be avoided and minimized, to the greatest extent feasible. All work in suitable habitat (California annual grasslands) will be restricted during the flight and mating season (mid-May to mid-July) and a minimum 300-foot buffer will be established around host plants.

Where project activities affect Callippe silverspot butterfly habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation*. With the implementation of BR-16 and SMP mitigation required, impacts to this species would be less than significant.

California Red-legged Frog (Rana draytonii)

California red-legged frog uses a variety of habitat types; these include various aquatic systems as well as riparian and upland habitats. However, they may complete their entire life cycle in a pond or other aquatic site that is suitable for all life stages (66 Federal Register [FR] 14626). California red-legged frog inhabits marshes, streams, lakes, ponds, and other, usually permanent, sources of water that have dense riparian vegetation. For this analysis, suitable habitat is considered to exist in all alkali meadow and scalds, alkali wetlands, California annual grassland, mixed riparian forest and woodland, mixed willow riparian scrub, perennial freshwater marsh, riverine stream, seasonal wetland, and sycamore alluvial woodland. There are approximately 125 documented California red-legged frog occurrences in the species study area (California Natural Diversity Database 2015). In addition, the SMP Area is within East San Francisco Bay Critical Habitat (Unit CCS-2B). North of Interstate 580, critical habitat has been designated for this species. Natural creeks potentially provide the highest quality habitat for California red-legged frog in the SMP Area. These channels typically have in-channel vegetation and slow moving, backwater areas that provide microhabitat features essential for this species. This does not preclude California red-legged frog from occurring in other engineered or modified channels. For example, occurrences of California red-legged frog have been recorded in Arroyo Las Positas, the majority of which is a straightened and channelized urban creek (California Natural Diversity Database 2013). Nonetheless, the overall habitat quality is lower in those channels since they often do not contain the complexity necessary to support the frog's life cycle. Creeks and channels within the SMP Area that potentially support this species include Arroyo Las Positas, Arroyo Seco, Realigned Arroyo Las Positas, Altamont Creek, and Collier Canyon Creek. Based on abundant known occurrences within the SMP Area and available habitat, potential for occurrence of California red-legged frog is considered to be high.

The SMP estimates that 552 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 96 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-17). This species is not expected to occupy all suitable habitat; rather, it is expected to

occur in portions of available suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be less. Nonetheless, the potential for this species to be impacted is likely, and such impacts would be considered significant.

The SMP includes two BMPs to avoid and minimize impacts to California red-legged frog during SMP activity implementation (see BMP BR-9 and BMP BR-10 in SMP Table 7-1). The BMPs require surveys for this species to occur in suitable habitat (alkali meadow and scalds, alkali wetland, California annual grassland, mixed riparian forest and woodland, mixed willow riparian scrub, perennial freshwater marsh, riverine stream, seasonal wetland, and sycamore alluvial woodland) prior to the initiation of Program activities. If suitable breeding or foraging habitat is present then focused surveys using the USFWS California red-legged frog survey protocol will be completed or California red-legged frog presence will be assumed. The USFWS will be contacted and any site-specific recommendations will be implemented. If California red-legged frog is present or assumed present, a qualified biological monitor will inspect the area daily before the start of work and will be present during maintenance activities in sensitive habitats. If appropriate, the City will install exclusionary fencing. If dewatering of a creek is required, dipnet and seine surveys for California red-legged frog tadpoles will be completed prior to initiation of dewatering. Captured tadpoles will be moved to a safe location elsewhere in the creek. Work will be avoided within suitable California red-legged frog habitat from October 15 (or the first measurable fall rain of 1" or greater) to May 1.

Where project activities affect California red-legged frog habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation.* With the implementation of BR-9 and BR-10 and SMP mitigation (as required), impacts to this species would be less than significant.

*California Tiger Salamander (*Ambystoma californiense*)*

California tiger salamander requires two major habitat components: aquatic breeding sites and terrestrial upland sites. California tiger salamander inhabits valley and foothill grasslands and the grassy understory of open woodlands, usually within one mile of water. Suitable upland habitat includes most undeveloped sites surrounding the urbanized City core. For the purpose of this analysis, suitable breeding habitat includes alkali wetland and seasonal wetland, and upland habitat includes alkali meadow and scald, and California annual grassland. There are approximately 143 CNDDB occurrences of California tiger salamander in the species study area have been documented primarily along Arroyo Mocho, Arroyo Seco, Altamont Creek, Arroyo Las Positas, Cottonwood Creek, and Collier Canyon Creek (California Natural Diversity Database 2015); therefore, potentially suitable breeding habitat may occur in each of these creeks and channels. Based on habitat availability within the SMP Area and the proximity to known occurrences, potential for California tiger salamander to be found in the SMP Area is considered to be high.

The SMP estimates that 226 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, 46 acres of suitable habitat could be affected by implementation of the SMP activities (see SMP Table 6-16). This species is not expected to occupy all suitable habitat; rather, it is expected to occur in portions of available suitable habitat. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be less. The potential for this species to be impacted is possible, and such impacts would be considered significant.

Since California tiger salamander do not typically occur in stream channels, in-channel maintenance activities will have little direct effect on this species; however, road mortality of migrating California tiger salamander can be a concern during winter rains. SMP maintenance activities are unlikely to affect salamanders because migration occurs almost exclusively at night during rainfall and City crews typically work during daylight hours due to safety concerns. During the dry season (summer months), California tiger salamander are typically underground and may be affected by maintenance

activities that result in ground disturbance (i.e., excavation, grading). If ground disturbance along the shoulders of access roads or creek/channel banks occurs, there is the potential for individuals to be crushed in burrows or excavated out of burrows. During any time of year, excavation of ground squirrel or pocket gopher burrows could impact upland habitat for this species. As such, specific avoidance and minimization practices will be conducted during maintenance activities that could directly impact suitable subsurface habitat.

The SMP includes three BMPs to avoid and minimize impacts to California tiger salamander (see BMP BR-11, BR-12, and BR-13 in SMP Table 7-1). The three BMPs include requirements that apply to sediment and debris removal activities (BR-11), vegetation management activities (BR-12), and bank stabilization activities (BR-13). These BMPs require that a qualified biologist conduct pre-maintenance surveys of upland habitats and identify areas with small mammal burrows. Areas with an abundance of small mammal burrows will be flagged and avoided by maintenance crews. SMP activities located in proximity to upland California tiger salamander habitat will be timed to avoid the California tiger salamander migration season (October 15- June 30). If work must be completed during the migration season, barrier fencing will be installed to exclude California tiger salamander from maintenance areas. The biologist will have the authority to stop work if California tiger salamander is encountered until such a time as the animal is moved to an area away from the project site.

Where project activities affect California tiger salamander habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation.* With the implementation of BMP BR-11, BR-12, and BR-13, and SMP mitigation (as necessary), impacts on the California tiger salamander would be less than significant.

Western Pond Turtle (Emys marmorata)

Western pond turtle occurs from Baja California to the lower Columbia River in Oregon and Washington (Jennings et al. 1992). Western pond turtles are thoroughly aquatic, preferring the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 1985). The species occurs in a wide range of both permanent and intermittent aquatic environments (Jennings et al. 1992). Western pond turtles spend considerable time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris. Western pond turtles also spend time in upland habitats during the spring and summer, frequently moving between aquatic and upland habitats (Rathbun et al. 2002). They move up to 1,300 feet or more to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Western pond turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992). Suitable habitat for western pond turtle includes California annual grassland, mixed riparian forest woodland, mixed willow riparian scrub, perennial freshwater marsh, pond, riverine stream, sycamore alluvial woodland, valley sink scrub, golf course/urban park, ruderal, and rural residential. There are 14 documented occurrences of western pond turtle within the species study area (California Natural Diversity Database 2015).

It is estimated that 573 acres of suitable habitat exists in the SMP Area. Of this, up to 81 acres of suitable habitat could be affected by implementation of SMP activities. However, this species is not expected to nest or occur in all suitable habitat; rather, it is expected to nest in portions of suitable upland habitat that meet its nesting criteria, and to potentially be found in areas of suitable aquatic habitat. Thus, the estimate of impact to suitable habitat is the maximum amount that could possibly occur, and potential suitable habitat impacts are expected to be much less. Therefore, the potential for this species to be impacted is possible, but low. Such impacts would be considered significant.

Project activities have the potential to result in the direct mortality or injury of western pond turtles by being crushed in burrows or excavated out of burrows from activities in upland habitat or crushed or buried during activates in aquatic habitat. Such impacts would be a significant impact to western pond turtle. However, with implementation of BMP BR-14 in the SMP (which requires preconstruction surveys and temporary relocation if turtles are found in the construction zone), the City will avoid impacting individual western pond turtles. With overall SMP implementation, aquatic habitat for western pond turtles should be roughly equivalent or better than that extant at present. With the implementation of BMP BR-14 and the SMP, impacts to this species would be less than significant.

Golden Eagle (Aquila chrysaetos)

Golden eagles use nearly all terrestrial habitats of the western states except densely forested areas. In the interior central Coast Ranges of California, golden eagles favor open grasslands and oak savanna, with lesser numbers in oak woodland and open shrublands. Secluded cliffs with overhanging ledges and large trees are used for nesting and cover. Preferred territory sites include those that have a favorable nest site, a dependable food supply (medium to large mammals and birds), and broad expanses of open country for foraging. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats. Deeply cut canyons rising to open mountain slopes and crags are ideal habitat. For this analysis, suitable foraging habitat is assumed to exist on all alkali meadow and scalds, alkali wetlands, California annual grassland, seasonal wetlands, valley sink scrub, and cropland. Potentially suitable nesting habitat occurs in tall trees situated away from human development, primarily undeveloped areas north of Interstate 580 and south of the Cities of Pleasanton and Livermore. There are six CNDDB occurrences of the species within the species study area, and the nearest documented nest is 3.2 miles to the south (California Natural Diversity Database 2015). Suitable foraging habitat occurs within the SMP Area, particularly north of Interstate 580, as well in other undeveloped portions of the City. Potential for golden eagles to nest in the SMP Area is possible, but considered low. Most records of golden eagle nests are located in the open, less populated areas north and south of the City. In contrast, potential for golden eagles to forage in the SMP Area is considered moderate, with the species having a high potential to forage closer to nests.

The SMP estimates that 258 acres of suitable foraging habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 46 acres of suitable foraging habitat could be affected by implementation of SMP activities (see SMP Table 6-18). Most stream maintenance activities, if conducted during the breeding season, have the potential to impact nesting golden eagles, as well as other raptors and migratory birds, if conducted near an active nest. This is due to the highly sensitive nature of this species when nesting. Therefore, the potential for this species to be impacted is possible, but low. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to golden eagle (see BMP BR-17 in SMP Table 7-1). This BMP requires work to be conducted outside of nesting season. If an active nest is identified near a proposed work area and work cannot be conducted outside of the nesting season, a no-activity zone will be established by a qualified biologist. The no-activity zone will be large enough to avoid nest abandonment and will at a minimum be 250-feet radius from the nest. If an effective no-activity zone cannot be established in either case, an experienced golden eagle biologist will develop a site-specific plan (i.e., a plan that considers the type and extent of the proposed activity, the duration and timing of the activity, the sensitivity and habituation of the eagles, and the dissimilarity of the proposed activity with background activities) to avoid the potential to affect the reproductive success of the eagles.

Where project activities affect occupied golden eagle habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream*

Maintenance Program Mitigation. With the implementation of BMP BR-17 and SMP mitigation (as appropriate), impacts to this species would be less than significant.

*Tricolored Blackbird (*Agelaius tricolor*)*

Tricolored blackbirds have three basic requirements for selecting their breeding colony sites: open, accessible water; a protected nesting substrate, including flooded, thorny, or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony. For this analysis, suitable habitat is assumed to exist on all mixed willow riparian scrub, perennial marsh, and riverine stream. There are eight documented occurrences of nesting and foraging tricolored blackbird in eastern Alameda County (California Natural Diversity Database 2015). Potentially suitable foraging habitat occurs within the SMP Area, particularly north of Interstate 580, as well in other undeveloped portions of the City. Potentially suitable breeding habitat for this species occurs along Arroyo del Valle. Tricolored blackbirds are likely to return to the same nesting site multiple years in a row. Based on known occurrences in the SMP Area, the potential for the occurrence of tricolored blackbird is likely.

The SMP estimates that 85 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 7 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-19). Furthermore, this species is not expected to nest in all suitable habitat; rather, it is expected to nest in portions of available suitable habitat that meet its nesting criteria. Impacts to foraging habitat may be high as requirements for foraging habitat are relatively general, but impacts to nesting habitat would be low since the species requirements are more specific for nesting habitat and suitable nesting habitat it not as abundant within the SMP Area. Thus, the estimate of impact to suitable habitat (the majority of which is only foraging habitat) is the maximum amount that could possibly occur, and potential suitable habitat impacts are expected to be much less. Therefore, the potential for this species to be impacted is possible, but low. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to tricolored blackbirds (see BMP BR-18 in SMP Table 7-1). This BMP requires work to be conducted outside of the nesting season (March 15 to September 1) if an active nesting colony is identified near a proposed work area.

Where project activities affect occupied tricolored blackbird habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation.* With the implementation of BR-18, and SMP mitigation (as necessary), impacts to this species would be less than significant.

*Western Burrowing Owl (*Athene cunicularia hypugea*)*

Burrowing owls occupy grasslands, deserts, sagebrush scrub, agricultural areas (including pastures and untilled margins of cropland), earthen levees and berms, coastal uplands, and urban vacant lots, as well as the margins of airports, golf courses, and roads. For this analysis, suitable habitat for this species is assumed to exist on all alkali meadows and scalds, California annual grasslands, and valley sink scrub land cover types. There are 40 documented occurrences of burrowing owls in the species study area, many of which are records of nesting pairs (California Natural Diversity Database 2015). Potentially suitable habitat for this species occurs adjacent to creeks and channels north of Interstate 580, as well as along portions of Arroyo Las Positas, Altamont Creek, Arroyo Seco, Arroyo del Valle, and Arroyo Mocho. Based on the suitable habitat within the SMP Area and abundance of occurrences, potential for the occurrence of western burrowing owl is considered high.

There are approximately 210 acres of suitable western burrowing owl habitat in the SMP Area (see SMP Table 3-1). Of that, 29 acres could be impacted by the implementation of the SMP activities (see

SMP Table 6-20). Bank stabilization and revegetation activities (including any upland construction staging), have the potential to impact western burrowing owls at any time of the year, including affecting active nesting burrows. Other activities, particularly those that require mobilizing large equipment, have the potential to disturb nesting birds due to excessive noise or crushing of burrows if equipment is driven off-road. In-stream sediment removal and vegetation management activities would not directly impact burrowing owls as the stream bed is not their preferred habitat. This species is not expected to occupy all suitable habitat; rather, it is expected to occur in areas of suitable habitat which includes sites with ample ground squirrel burrows. Thus, the estimate of impact is the maximum amount that could possibly occur, and actual potential impacts are expected to be much less. The potential for this species to be impacted exists, and such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to the western burrowing owl (see BR-19 in SMP Table 7-1). This BMP requires that burrowing owl surveys will be completed consistent with the *CDFW Staff Report on Burrowing Owl Mitigation (2012)*. If an active nest is identified near a proposed work area, work will be conducted outside of the nesting period (February 1 to September 1). If an active nest is identified near a proposed work area and work cannot be conducted outside of the nesting season, a no-activity zone will be established by a qualified biologist. The no-activity zone will be large enough to avoid nest abandonment and will at a minimum be 250-feet radius from the nest. If burrowing owls are present where work is proposed during the non-breeding season, a qualified biologist will establish a no-activity zone of at least 150 feet. If this is not feasible, a qualified biologist will develop a site-specific plan that considers the type and extent of the proposed activity, the duration and timing of the activity, the sensitivity and habituation of the owls, and how the proposed activity differs from the authorized routine maintenance activities to avoid and minimize potential impacts on western burrowing owls.

Where project activities affect occupied western burrowing owl habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation.* With the implementation of BR-19, and SMP mitigation (as necessary), impacts to this species would be less than significant.

*San Joaquin Kit Fox (*Vulpes macrotis mutica*)*

San Joaquin kit foxes occur in a variety of habitats, including grasslands, scrublands, vernal pool areas, alkali meadows and playas, and an agricultural matrix of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands (U.S. Fish and Wildlife Service 1998). They prefer habitats with loose-textured soils (Egoscue 1962) that are suitable for digging, but they occur on virtually every soil type. Dens are generally located in open areas with grass or grass and scattered brush, and seldom occur in areas with thick brush. Preferred sites are relatively flat, well-drained terrain (U.S. Fish and Wildlife Service 1998; Roderick and Mathews 1999). They are seldom found in areas with shallow soils due to high water tables or impenetrable bedrock or hardpan layers (U.S. Fish and Wildlife Service 1998). However, kit foxes may occupy soils with a high clay content where they can modify burrows dug by other animals, such as California ground squirrels (*Spermophilus beecheyi*) (Orloff et al. 1986).

In the northern part of its range (including San Joaquin, Alameda, and Contra Costa Counties) where most habitat on the valley floor has been eliminated, kit fox now occurs primarily in foothill grasslands (Swick 1973; U.S. Fish and Wildlife Service 1998), valley oak savanna, and alkali grasslands (Bell 1994). Retaining a linkage between San Joaquin kit fox populations in western Merced County north into San Joaquin, Alameda, and Contra Costa Counties is an important recovery goal for this species (U.S. Fish and Wildlife Service 1998). There are six San Joaquin kit fox occurrence records in the eastern portion of the species study area, in open habitat including grasslands, pastures, rangeland, and scrubland (California Natural Diversity Database 2015).

The SMP estimates that 210 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 22 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-22). San Joaquin kit fox adults and pups could be directly impacted (loss of foxes) or injured by vehicles accessing maintenance areas in suitable habitat (grassland, scrubland, vernal pool, alkali meadow and playa, and an agricultural matrix of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands [U.S. Fish and Wildlife Service 1998]). Impacts to foraging habitat within grassland, alkali meadow and playa, row crop, irrigated pasture, orchard, vineyard, and grazed annual grassland habitat would be temporary, as this habitat would regenerate within one year. However, the City will avoid impacts to San Joaquin kit fox dens entirely through the implementation of SMP BMP BR-20.

Where project activities affect San Joaquin kit fox habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and Wildlife Stream Maintenance Program Mitigation.* With the implementation of BMP BR-20, and SMP mitigation (as appropriate), impacts to this species would be less than significant.

*American Badger (*Taxidea taxus*)*

American badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub. A recent study in the San Francisco Bay Area documented the use of suburban areas as movement corridors between larger patches of grassland (T. Diamond, Personal Communication 2010). For this analysis, suitable habitat is assumed to exist in alkali meadow and scald, California grassland, sycamore alluvial woodland, valley sink scrub, cropland, ruderal, and rural residential land cover types. Potentially suitable habitat for this species in the SMP Area occurs north of Interstate 580 and along the upstream portion Arroyo Seco in the southeastern portion of the City. There are eight occurrences of American badger in the species study area (California Natural Diversity Database 2015).

The SMP estimates that 210 acres of suitable habitat exists in the SMP Area (see SMP Table 3-1). Of this, up to 28 acres of suitable habitat could be affected by implementation of SMP activities (see SMP Table 6-21). This species is not expected to occur in all suitable habitat at all times; rather, it is expected to den in portions of available suitable habitat that support high densities of small burrowing mammals and occasionally migrate through other open areas of habitat. Impacts to migratory habitat may be high as requirements for migratory habitat are relatively general, but impacts to denning habitat would be low since the species requirements are more specific for this habitat and it is not as abundant within the project area. Thus, the estimate of impact to suitable habitat (the majority of which is migratory habitat) is the maximum amount that could possibly occur, and potential suitable habitat impacts are expected to be much less. Where appropriate, surveys for this species will occur as part of the site reconnaissance during annual work plan development to determine presence or absence. Therefore, the potential for this species to be impacted is possible, but low and such impacts would be considered significant.

Program maintenance activities within creeks and channels are not expected to result in effects to American badger because stream corridors are not their preferred habitat. Badgers and cubs could be directly impacted (loss of badgers) or injured by vehicles accessing maintenance areas in suitable habitat. Impacts to migratory habitat within alkali meadow and scald, California grassland, cropland, ruderal, and rural residential habitat would be temporary, as this habitat would regenerate within one year. However, the City will avoid impacts to American badger dens through the implementation of SMP BMP BR-20.

Where project activities affect occupied American badger habitat, SMP mitigation would be implemented consistent with the discussion below under the heading *Special-Status Plant and*

Wildlife Stream Maintenance Program Mitigation. With the implementation of BMP BR-20, and SMP mitigation (as appropriate), impacts to this species would be less than significant.

Special-Status Plant and Wildlife Stream Maintenance Program Mitigation Strategy

While it is not possible to know exactly how much of the total area of impact will be permanently impacted vs. temporarily impacted, Chapter 6 of the SMP discusses potential permanent and temporary adverse and beneficial impacts associated with SMP activities. SMP activities that are expected to have permanent adverse impacts include bank stabilization, bridge repair/replacement, and culvert repair/replacement. Permanent impacts are associated with the introduction of new hardscape (e.g., placement of rock rip-rap as part of bank stabilization or expansion of a concrete apron associated with a culvert repair). Most activities would only result in temporary adverse impacts to species and their habitat (see SMP Table 6-1 for a summary of impacts grouped by Beneficial Uses).

Impacts to habitat (or occupied habitat as noted above) that are not avoided and minimized through use of the SMP Maintenance Principals (SMP Chapter 4) and the SMP BMPs (SMP Table 7-1) may require compensatory mitigation. The SMP (Chapter 8) describes a strategic approach to how mitigation will be identified, and also provides a compensatory mitigation ratio structure based on EACCS (see SMP Table 8-4).

SMP Mitigation Approach

The SMP's mitigation approach was developed through multiple discussions with agency representatives from the SFBRWQCB, CDFW, USFWS, and the USACE. Meetings were held with individual agencies and also as group meetings to develop the SMP.

The mitigation planning approach follows a three-tiered system where mitigation opportunities are sought sequentially, focusing first and foremost on the project impact location itself, and utilizing Tier 2 and Tier 3 mitigations when Tier 1 mitigation opportunities are not sufficient to compensate for project impacts. Tier 1 mitigation is implemented on-site within the specific reach where the maintenance work was conducted. On-site mitigation actions are intended to enhance and restore the stream and aquatic functions, as well as species habitat, that were impacted through the maintenance activities in kind (i.e., restore the site to pre-project or ecologically improved conditions).

Tier 2 mitigation is similar to Tier 1 mitigation in seeking in-kind mitigation in creeks and channels that have undergone maintenance. However, Tier 2 mitigation is applied at other creeks and channels, and is therefore not on-site. Tier 2 mitigation is sought when there are no suitable opportunities for enhancement or restoration in a maintenance reach and the next best opportunity is to pursue in-kind mitigation at a neighboring reach that does afford an opportunity for mitigation.

Tier 3 mitigation is off-site mitigation that provides compensation in the form of enhancement to watershed functions and values. Tier 3 mitigation addresses residual impacts from SMP activities that are not adequately mitigated through Tier 1 and 2 mitigation actions. Tier 3 off-site mitigation address the temporal loss of Beneficial Uses and ecological functions and values during the time gap between SMP maintenance activities and when Tier 1 mitigation occurs, and the time when Tier 1 mitigation has become fully functional and the temporary impacts have been eliminated. Tier 3 mitigation is not only different in its geographic scope, it is also different in that it is not always solely a City effort, but is a collaborative effort with partnering agencies. This is accomplished through an watershed-based mitigation program, whereby the City implements or funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools and Resource Conservation Districts (RCDs).

The three-tier mitigation approach ensures that mitigation is first and foremost directed to compensate for the impacts occurring at the specific project reach, then expanded if necessary to consider all impacted reaches within the watershed as a whole should opportunities within the specific project reach be insufficient to compensate for impacts.

SMP Mitigation Ratios

The SMP (see SMP Table 8-4) provides temporary and permanent mitigation ratios to compensate for impacts to focal species if impacts cannot be avoided by implementation of the SMP Maintenance Principals (SMP Chapter 4) and SMP BMPs (SMP Table 7-1). Species-specific mitigation ratios are provided for special-status species including longhorn fairy shrimp, vernal pool fairy shrimp, Callippe silverspot butterfly, California red-legged frog, California tiger salamander, golden eagle, tricolored blackbird, western burrowing owl, American badger, San Joaquin kit fox, San Joaquin spearscale, Congdon's tarplant, palmate-bracted bird's-beak, and Livermore tarplant (SMP Table 8-4). As described in SMP Chapter 8, permanent impact mitigation needs will be met by replacement of habitat affected. For example, if a bank stabilization project results in a permanent loss of 0.02 acre seasonal wetland and a temporary loss of 0.3 acre California annual grassland in an area where California red-legged frog are assumed to be located (but outside critical habitat), then 0.06 acre of seasonal wetland would need to be created (at a 3:1 ratio) and 0.3 acre of California annual grassland would need to be protected (at a 1:1 ratio). This mitigation would address both the wetland impact and the impact to the California red-legged frog. Species mitigation may also be met through the purchase of mitigation credits at an approved mitigation bank.

Temporary impact ratios are one-third of the permanent impact ratio, and mitigation needs will be met in the same way as permanent impacts through restoration, creation, and protection, or purchase of mitigation credits. Mitigation for temporary impacts will be required every time focal species habitat is affected, up to three times in the same location. Once a site has been mitigated three times over, the total mitigation for that site over time will be equal to the mitigation ratio for permanent impacts to species and their habitat. As such, once a site has been temporarily impacted three times, and mitigation for the same site has accrued to the equivalent of a permanent impact to species habitat, the site is assumed to be permanently impacted and no further species mitigation is required even if the site is maintained one or more times thereafter.

Species mitigation and aquatic resources mitigation (discussed below under Checklist topics "b" and "c") may, at times, overlap. In such cases, the same restoration, creation, and preservation acreages may be used to meet multiple mitigation needs and are not additive.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant with Mitigation.

Program activities will impact riparian habitat and other sensitive natural communities. These activities consist of sediment management, vegetation management, and bank stabilization associated with maintenance of creeks and channels within the SMP Area, and other program activities consist of bridge maintenance, culvert repair and replacement, irrigation system maintenance, trash and debris removal, and access road and trail maintenance.

Project activities have the potential to impact 165 acres of riparian habitat and 0.4 acre of designated Springtown Alkali Sink. Other potential impacts to wetland habitats are discussed below under Checklist topic "c."

Riparian Habitat

Riparian habitat is found along the following creeks and/or channels: Arroyo Del Valle, Arroyo Las Positas, Arroyo Mocho, Arroyo Seco, Collier Canyon Creek, and Cottonwood Creek. The SMP estimates that 272 acres of this habitat (mixed riparian forest and woodland, sycamore alluvial woodland, and mixed willow riparian scrub) (see SMP Table 3-1). Of this, up to 37 acres (37 acres of mixed riparian forest and woodland, 4 acres of sycamore alluvial woodland, and 4 acres of mixed willow riparian scrub) of riparian habitat could be affected by implementation of SMP activities (see SMP Table 6-24). The estimate of impact is the maximum amount that could possibly occur, and actual impacts are expected to be much less. Such impacts would be considered significant.

The SMP includes a BMP to avoid and minimize impacts to existing vegetation (see BMP BR-1 in SMP Table 7-1) and employ minimal creek access routes (see BMP GEN-1 in SMP Table 7-1), which would avoid and minimize disturbance to riparian habitat. While avoidance and minimization of impacts to riparian habitat reduces impacts to the minimum amount required to conduct SMP maintenance activities, any residual impacts would be significant.

The SMP Mitigation Program described in Chapter 8 of the SMP requires compensation for impacts to riparian habitat. Mitigation varies depending on if the impact is temporary or permanent. Temporary impacts occur if the site is restored to pre-project or better condition within one year of construction completion. Permanent impacts are impacts that are not temporary (i.e., do not return to pre-project or better condition within a year of construction completion). Permanent impacts are generally only anticipated in locations where new hardscape is placed (e.g., a bank stabilization that requires use of rock rip-rap), or—as described above—when a site is maintained so often that a permanent impact is attributed to the site.

As described above, species impacts require mitigation. Three species evaluated in this section utilize riparian land cover types as suitable habitat (California red-legged frog, western pond turtle, and tricolored blackbird). Any mitigation identified for these species will be evaluated to identify if it also serves as adequate riparian mitigation as described in Chapter 8 of the SMP. If the species mitigation meets the need for riparian mitigation, it will count for both species and riparian mitigation.

If impacts to riparian habitat cannot be avoided, In order to ensure that implementation of the SMP results in no net loss of riparian habitat functions and values, the City will mitigate for permanent impacts to riparian habitat through restoration, creation, and/or preservation of riparian habitat. Restoration, creation, and preservation opportunities within the SMP Area include areas along the stream reaches covered by the SMP. The mitigation ratio for permanent impacts will be 1.5:1 (mitigation to impact). This ratio applies to impacts to in-channel (the channel banks and creek bed), non-invasive riparian vegetation (see SMP Table 5-1 for a list of Cal-ICP invasive species). The SFBRWQCB regulates impacts and mitigation for impacts to riparian habitat on a linear foot basis, as well as an acreage basis. Mitigation for riparian habitat habitats will be expressed both in units of acres and linear feet parallel to the direction of flow.

Temporary impacts to riparian habitat will be mitigated at a 1.1:1 ratio (mitigation to impact) following the impacting SMP activity based. All mitigation will occur based on the Tier 1 mitigation approach where feasible. If the site does not allow sufficient space to mitigate impacts, the mitigation ratio will be met using the Tier 2 mitigation approach (i.e., off-site mitigation in the SMP Area). Mitigation actions will ensure that the functions and values of the stream reach are improved over pre-project conditions.

The implementation of SMP mitigation would reduce the impacts to riparian habitat to less than significant.

Springtown Alkali Sink

Biotic communities within the sink consist of valley sink scrub, alkali grassland, and California annual grassland. The Springtown Alkali Sink is unique, in part, because of its concentration of special-status species. Probably the most unique of these species is palmate-bracted bird's beak, listed as endangered under ESA and CESA. Other special-status plant species that occur in the sink include brittlescale, San Joaquin spearscale, hispid bird's-beak, and Livermore Valley tarplant. Approximately 2 acres of the Springtown Alkali Sink occur within the SMP Area of reach AC-2 of Altamont Creek, within which SMP activities have the potential to impact 0.4 acre of valley sink scrub habitat within the Springtown Alkali Sink. The estimated impact is the maximum amount that could possibly occur, and actual impacts are expected to be much less. Such impacts to valley sink scrub in the Springtown Alkali Sink would be considered significant.

The SMP includes a BMP to avoid impacts to vernal pools and avoid and minimize impacts to existing vegetation (see BMP BR-1 in SMP Table 7-1), and employ minimal creek access routes (see BMP GEN-1 in SMP Table 7-1), both of which would avoid disturbance to habitat in the Springtown Alkali Sink. While avoidance and minimization of impacts to sensitive natural communities, such as the Springtown Alkali Sink, reduces impacts to the minimum amount required to conduct SMP maintenance activities, impacts could still occur and would be considered significant.

Mitigation Measure BIO-1 (below) requires compensation for valley sink scrub habitat impacted in the Springtown Alkali Sink. The City will establish monitoring success criteria for restored and preserved sites to be monitored for a minimum of 5 years and until success criteria are satisfied. The implementation of Mitigation Measure BIO-1 below would reduce the impacts to valley sink scrub habitat in the Springtown Alkali Sink to less than significant.

Mitigation for impacts to species is required as part of SMP mitigation. Any mitigation identified for species or natural communities will be evaluated to identify if it also serves as adequate mitigation for impacts to the valley sink scrub land cover type when located within the Springtown Alkali Sink. If the species mitigation meets the need for valley sink scrub mitigation, it will count for both species and valley sink scrub.

Mitigation Measure BIO-1: Springtown Alkali Sink Preservation, Restoration, and Management

If impacts to the valley sink scrub habitat within the Springtown Alkali Sink cannot be avoided, the City shall restore or preserve valley sink scrub habitat at a ratio of 1.5:1 (mitigation to impact) for permanent impacts within the greater Springtown Alkali Sink area with preference for habitat adjacent to the existing Springtown Sink Alkali Preserve[1]. Restored and/or preserved habitat will be protected and managed similar the Springtown Alkali Sink Preserve.

Temporary impacts to valley sink scrub habitat within the Springtown Alkali Sink will be mitigated at a 1.1:1 ratio (mitigation to impact) through enhancement of the project site following the impacting SMP activity based on the Tier 1 mitigation approach. If the site does not allow sufficient space to mitigate temporary impacts, the mitigation ratio will be met using the Tier 2 mitigation approach (i.e., off-site mitigation in the SMP Area). Mitigation actions will ensure that the functions and values of the stream reach are improved over pre-project conditions.

[1] This mitigation ratio only applies to impacts to the valley sink scrub land cover type when occurring within the Springtown Alkali Sink. If focal species are also impacted, they will be mitigated according to SMP Table 8-4. For example, if a bank stabilization project results in a permanent loss of 0.02 acre of valley sink scrub within the Springtown Alkali Sink in an area where vernal pool fairy shrimp are assumed to be located, then 0.13 acre of valley sink scrub would be preserved (at a 6.5:1 ratio to address both the land cover type impact as well as the vernal pool fairy shrimp impact) and 0.07 acre restored (at a 3.5:1 ratio to address the vernal pool fairy shrimp impact).

The City will identify success criteria for the selected Tier 1 and/or Tier 2 approach, including establishment of native valley sink scrub plant species cover within 70% of local reference populations, native valley sink scrub plant species composition within 70% of local reference populations, demonstration of success in both cover and composition for at least 3 years. Restored areas will be monitored for at least 5 years until success criteria are met. Adaptive management guidelines will be established for actions to be taken if the success criteria are not met. If progress is not satisfactory, then adaptive management actions (including replanting, nonnative species removal, etc.) may be implemented.

c. **Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

Less than Significant with SMP Mitigation.

Program activities will impact federally protected wetlands, other waters of the U.S. and waters of the state. These activities include sediment management, vegetation management, and bank stabilization associated with maintenance of creeks and channels within the SMP Area. Other program activities include bridge maintenance, culvert repair and replacement, irrigation system maintenance, trash and debris removal, and access road and trail maintenance.

The SMP estimates that 10 acres of alkali meadow and scalds, 14 acres of alkali wetland, 11 acres of perennial freshwater marsh, 22 acres of seasonal wetland, 2 acres of pond, and 41 acres of open water (see SMP Table 3-1) occur within the SMP Area. Within this area, SMP activities have the potential to impact 2 acres of alkali meadow and scalds, 4 acres of alkali wetland, 5 acres of perennial freshwater marsh, 18 acres of seasonal wetland, 0.5 acre of pond, and 1 acre of riverine stream. The estimate of 30 acres of impact is the maximum amount that could possibly occur, and actual impacts are expected to be much less. Such impacts would be considered significant.

The SMP includes BMPs to avoid impacts to vernal pools, avoid and minimize impacts to wetlands and other waters (see BMP BR-1 in SMP Table 7-1), and employ minimal creek access routes (see BMP GEN-1 in SMP Table 7-1). Implementation of these BMPs would avoid disturbance to wetlands and other waters of the U.S. and waters of the state. While avoidance and minimization of impacts to wetlands and other waters of the U.S. and waters of the state reduces impacts to the minimum amount required to conduct SMP maintenance activities, any residual impacts would be significant.

Mitigation for impacts to wetlands and waters is required as described in Chapter 8 of the SMP. Any mitigation identified for species will be evaluated to identify if it also serves as adequate mitigation for impacts to wetlands. If the species mitigation meets the need for wetlands and/or waters mitigation, it may count for both species and wetlands and/or waters.

SMP mitigation for residual impacts varies depending on if the impact is temporary or permanent. Temporary impacts occur if the site is restored to pre-project or better condition within one year of construction completion. A determination of project conditions will be made based on an evaluation of the functions and values of the Beneficial Uses of the reach affected by the activity. Permanent impacts are impacts that are not temporary (i.e., do not return to pre-project or better condition within one year of construction completion). Permanent impacts are generally only anticipated in locations where new hardscape is placed (e.g., a bank stabilization that requires use of rock rip-rap), or when a site is maintained so often that a permanent impact is attributed to the site.

In order to ensure that implementation of the SMP results in no net loss of wetland and stream habitat functions and values, the City will compensate for to the loss of wetlands/waters through restoration and/or creation and enhancement of in-kind wetlands/waters within the greater Livermore area following the SMP's three-tiered mitigation approach. The City will mitigate for permanent impacts to

wetlands/waters through restoration, creation, and/or preservation of wetlands. The mitigation ratio for permanent impacts will be 1.5:1 (mitigation to impact).

Temporary impacts to wetlands/waters will be mitigated at a 1.1:1 ratio (mitigation to impact) following the impacting SMP activity based on the Tier 1 mitigation approach. If the site does not allow sufficient space to mitigate temporary impacts, the mitigation ratio will be met using the Tier 2 mitigation approach (i.e., off-site mitigation in the SMP Area). Mitigation actions will ensure that the functions and values of the stream reach are improved over pre-project conditions.

On-site mitigation (Tier 1) will consider appropriate planting palette and design based on the flood control needs of the reach. The City will identify site-specific success criteria such as plant species composition and cover metrics based on reference wetlands and inundation duration based on reference wetlands. Adaptive management guidelines will be identified for actions to be taken if the success criteria are not met. The initial annual monitoring will assess the progress of the plantings according to predetermined success criteria. If progress is not satisfactory, then adaptive management actions (including replanting, nonnative species removal, etc.) may be implemented.

The implementation of SMP mitigation would reduce the impacts to wetlands and waters to less than significant.

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?

Less than Significant Impact.

The SMP does not result in the construction of any new barriers to movement. Limited activities with permanent impacts to streams (such as bank stabilization) would have individually small footprints and further would not impede movement through the site by native resident or migratory fish or wildlife species. Overall, the SMP is expected to result in a net increase in stream beneficial uses and therefore should have a beneficial effect on species movement overall.

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

No Impact.

The City of Livermore regulates any tree that is 60 inches in circumference at breast height (CBH) on private property zoned as single-family residential, any tree that is 24 inches CBH on private property with certain zoning requirements, any California native tree that is 24 inches CBH, any tree on undeveloped or underdeveloped property that is 18 inches CBH, and any tree within a riparian corridor that is 18 inches CBH. Compensation for the removal of trees within the proposed SMP Area that would qualify as protected trees under the City's Tree Preservation Ordinance (Ord. 1830 § 3, 2007) would comply with the tree replacement requirements of the ordinance. Therefore, the proposed project would not conflict with the local ordinance in place to protect trees.

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

No Impact.

EACCS is not a formal habitat conservation plan, but it does include many of the components of a habitat conservation plan and is intended to preserve endangered species through collaborative long-term habitat protection. Mitigation measures and associated mitigation ratios and locations for species regulated by the EACCS—namely California red-legged frog, California tiger salamander,

western burrowing owl, and San Joaquin kit fox—are consistent with the overall intent EACCS. Therefore, with implementation of the SMP BMPs in combination with these mitigation measures, the proposed project would not conflict with the EACCS.

5. CULTURAL RESOURCES

This section summarizes the prehistoric, ethnographic, and historic context of the SMP Area, the methods and results of the cultural resources investigation conducted for the proposed project, and a discussion of the potential impacts on cultural resources.

Environmental Setting

Prehistoric Context of the Livermore-Amador Valley

Several investigations in the Amador-Livermore Valley area serve as the basis for the local archaeological sequence. These investigations include CA-Ala-13 and CA-Ala-394 (Wiberg et al. 1998), CA-Ala-483 (Bard et al. 1992; Wiberg et al. 1997), CA-Ala-555 (Wiberg 1996), CA-Ala-42 (Wiberg et al. 1997) and CA-Ala-46 (Fong et al. 1991; Ambro 1993). There is evidence (predominately through radiocarbon dates) that the Valley has been continuously inhabited for about 3500 years. Generally, occupation periods are broken down into four chronologically distinct classifications.

Investigations at CA-Ala-483 provide the earliest evidence for occupation in the area, with radiocarbon dates of 3370 to 1320 BC (Middle Archaic Period/Early Horizon). Obsidian hydration studies conducted by Basin Research revealed a date of 2650 BC (Bard et al. 1992). This early occupation of CA-Ala-483 was characterized by a wetlands and upland hunting-collecting subsistence pattern, lacking marine or freshwater shellfish remains (Wiberg et al. 1998; Bard et al. 1992).

The Middle Period of the Amador-Livermore Valley is represented by CA Ala 394. The artifact assemblage of this site included stone and bone tools and dorsally extended burials, suggesting a relationship with the Windmiller Pattern of the lower Sacramento Valley-Delta region. The presence of charmstones, ceremonial chert and obsidian points, and bone artifacts indicate that the population was involved in complex trade networks and social life during this time (Wiberg et al. 1998).

The transition from Middle to Late period (the Middle/Late Transition or MLT) dates roughly from AD 500 to 1000 BC and is represented by CA-Ala-42 (Wiberg 1996). A total of 41 burials were recovered (all but one were flexed), as well as numerous *Olivella* beads and *Haliotis* pendants.

Sites from the Late or Emergent Period in the Amador-Livermore Valley generally reveal a greater diversity and intensification of resources exploitation (Wiberg et al. 1998). Sites from this period produced evidence for reliance on seeds, deer, rodents, rabbits, and birds. Obsidian was the primary material used for flaked stone tools, but it is found in smaller dimensions than in earlier periods. Late Period components at sites like CA-Ala-555 indicate that Late Period populations were somewhat larger than those from the Middle Period sites, but smaller than the Early Period populations at CA-Ala-483 (Wiberg et al. 1998).

Ethnographic Context

At the time of European contact, the San Francisco Bay Area was occupied by a group of Native Americans known as the Costanoans, or *Ohlone*. The term *Costanoans*, which is derived from the Spanish *Costaños*, meaning coast people, was attributed to this group by the Spanish explorers and early settlers (Levy 1978:485).

The SMP Area was inhabited by the Pelnen tribe of the Ohlone, whose territory included the western portion of the Livermore Valley and present-day Pleasanton, extending south to the canyon leading to Sunol Valley and no farther north than Dublin. Another small group, the Caburans, was a subsidiary village of the Pelnen group. The members of both groups were forced to join Mission San Jose in 1798 and 1805 (Milliken 1995:229; 251).

The first Spanish foray into Ohlone territory was conducted by Sebastian Vizcaíno, who in 1602 traveled through what is now the Monterey area. The first mission to be established in Ohlone territory was San Carlos de Borromeo in 1770. In general, Mission life was devastating to the Ohlone lifeway. Mission padres discouraged or banned traditional customs, rites, and rituals. In addition, interaction with the Spanish caused the introduction of disease to local populations. By 1832, Ohlones numbered less than 2,000 as a result of introduced diseases, harsh living conditions, and reduced birth rates (Cook 1943a, 1943b, Levy 1978:486).

Under the Mexican government, secularization of mission lands began in earnest in 1834. Most of the former mission land was divided among Mexican subjects, and the Ohlone who chose to remain in their ancestral territory usually became squatters. Some were given jobs as manual laborers or domestic servants on Mexican ranchos or, later, American cattle ranches (Milliken 1995).

Since the 1980s, the modern Ohlone community has undergone a period of revitalization based on familial ties and former rancheria affiliations. Although they have yet to receive formal recognition from the federal government, the Ohlone are becoming increasingly organized as a political unit and have developed an active interest in preserving their ancestral heritage.

Historical Overview

The proposed SMP Area is located in the City of Livermore and the Livermore Valley, Alameda County. The county, formed by state officials in 1853, incorporated the western and southern sections of Contra Costa County and a portion of Santa Clara County. The town of Alvarado served as the original county seat until officials relocated it to San Leandro in 1856, and then in Oakland in 1873, where the seat currently remains (Hoover et al. 1990:1).

As early as 1769, the Spanish explorer José Francisco Ortega led an expedition through present-day Alameda County. Seven years later, Juan Bautista de Anza and Pedro Font traveled through the region. In the early 1800s, Spain established the Misión del Gloriosísimo Patriarca Señor San José, currently referred to as Mission San Jose, 15 miles northeast of the present-day City of San Jose. Under the direction of Father Fermín Lasuen, Mission San Jose prospered as an agricultural and educational center for the surrounding rural area (Hoover et al. 1990:1-2).

Since its establishment in 1796, the Mission San Jose used the land now known as the Livermore Valley as grazing land for sheep and cattle. In 1822, Mexico gained independence from Spain. During the 1830s, the missions became secularized and the Mexican government allowed its citizens land grants throughout Alta California. In general, Rancho San Ramon, Rancho Santa Rita, Rancho El Valle de San Jose, and Rancho Las Positas comprise the Livermore Valley. In 1848, the United States defeated Mexico in the Mexican-American War, and Mexico surrendered its Alta California land through the Treaty of Guadalupe Hidalgo. That same year, the Gold Rush brought hundreds of immigrants to Alameda County on their way to the gold fields in California. Attracted by the fertile land and mild climate of the East Bay, many chose to stay. The area quickly became one of the leading agricultural hubs of California, with agriculture, dairy farming, and livestock grazing serving as the principal industries of the period (Livermore Heritage Guild 2000).

Town of Livermore

William Mendenhall established the town of Livermore on a 100-acre portion of his property in 1869. Upon establishing the town, named after Robert Livermore, Mendenhall gave 20 acres to the Central Pacific Railroad (CPRR) to build a railroad station so that the transcontinental railroad would travel through the township. The establishment of a Western Pacific Railroad line (an independent branch of the CPRR) caused Livermore to quickly become the economic center of the region.

Over the following decades, the town grew slowly- just over 1,500 made it their home by the turn of the century. The surrounding area remained primarily an agricultural community that was mostly populated with small farms and larger wheat ranches. In 1913, transportation was improved with the construction of the Lincoln Highway through Livermore Valley and the City of Livermore. Also during this period, Western Pacific Railroad (a different company than the nineteenth century Western Pacific mentioned above) laid tracks just south of the existing (nineteenth century) Western Pacific railroad alignment (William Self Associates 2002:4).

The region supported a population of approximately 3,000 through the middle of the twentieth century. The post-World War II period, however, ushered in new development in the form of an airport and military facilities as well as the establishment of the Lawrence Livermore Laboratory. In the latter half of the twentieth century, Livermore and the Livermore Valley experienced continuous growth in the form of commercial and residential development. At the beginning of the twenty-first century, the city had a population of around 73,000 (William Self Associates 2002:3).

Records Search

Efforts to identify cultural resources in the SMP Area consisted of conducting a records search and literature review for the SMP Area and a 1/8-mile radius around the SMP Area. All of this information was obtained from the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University on July 26, 2012. In addition to the site records and study reports, several historic maps, including GLO Plat maps, Rancho maps, the Thompson & West Historical Atlas Map of Alameda County, and relevant topographic maps, were also reviewed.

Results

Fourteen previously recorded archaeological resources were identified within the SMP Area, and an additional sixteen previously recorded archaeological resources were identified within 1/8-mile of the SMP Area. Of the resources within the SMP Area, three are prehistoric (one village site recorded in 1950), one unknown (recorded in 1950 and likely prehistoric, but no further information is provided on the site record), and one isolate (groundstone). The Gandolfo Ranch District, which has been evaluated and found eligible for the National Register of Historic Places, is also located within/adjacent to the SMP Area. The remaining 10 resources consist of historic resources (a rail line segment; a canal; the Robert Livermore adobe site; a trough; structural remains; a fence; a portion of the South Bay Aqueduct; two bridges; and a portion of the Contra Costa Las Positas Transmission Line).

Of the resources within 1/8-mile of the SMP Area, six are prehistoric (all are groundstone or flake isolates or scatters). The Gandolfo Ranch District also extends outside the SMP Area. The remaining nine resources consist of historic resources (one house and barn; two farm complexes; an "abandoned" portion of the Southern Pacific Railroad; 2 abandoned structures; a collapsed well house with associated artifacts; a ranch complex, and a prefabricated Quonset warehouse). Aside from the Gandolfo Ranch District, none of the other previously recorded resources have been evaluated for NRHP eligibility.

The area has been extensively studied- within the SMP Area and 1/8-mile search radius, 103 studies have been conducted since the 1970s. One study, *A Cultural Resources Study for the North Livermore*

Master Plan/ Specific Plan, Environmental Impact Report, Alameda County (Wiberg et al. 1998) provides an extensive history of the project vicinity. The studies include a variety of overview reports; linear studies along pipeline routes and railroads; site-specific property studies (such as the Robert Livermore Adobe Site); studies for bridge replacements and road improvements; cellular tower studies, and several studies related to improving water quality in the project vicinity, including *A Cultural Resources Investigation for Livermore, Zone 1 Water System Improvement Project, Livermore, Alameda County* (Jones & Stokes 2003); *Cultural Resources Assessment Report, San Antonio Reservoir Pipeline Replacement Project, Alameda County* (Brown and Self 2003); and *Cultural Resource Assessment of the South Bay Aqueduct Improvement and Enlargement Project, Alameda County* (Brown et al. 2004).

Impact Analysis

Would the proposal:

a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact.

Although the background records search identified several historic properties in and within the vicinity of the SMP Area, including an NRHP-eligible Historic District, the minimal ground-disturbing activities associated with project implementation (i.e., vegetation management and bank stabilization) would not result in a direct impact to historic resources.

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

Less than Significant Impact with SMP BMPs.

Several archaeological resources, including a village site, were identified in the SMP Area. There is also the possibility that previously undiscovered surficial or buried archaeological resources (that may meet the definition of historical resource or unique archaeological resource) exist in the SMP Area. Such resources could be exposed during project-related ground-disturbing activities. There is, therefore, the possibility that the proposed project would cause a substantial adverse change in the significance of such resources. Damage to or destruction of such resources would be considered a potentially significant impact.

However, as discussed in the *Livermore Stream Maintenance Program Manual* (ICF International 2013), ground-disturbing activities conducted under this SMP will comply with BMP measures CR-1 (cultural resource investigation and monitoring) and CR-2 (inadvertent discovery procedures including data recovery as appropriate). Background records searches and NAHC consultation outreach have been conducted in support of future cultural resource inventories associated with annual maintenance activities, which identifies known cultural resources in the SMP Area. Will implementation of the SMP BMPs, impacts to archaeological resources would be less than significant.

c. Disturb any human remains, including those interred outside of formal cemeteries?

Less than Significant Impact with SMP BMPs.

As noted above, several archaeological resources, including a village site, were identified in the SMP Area. There is also the possibility that previously undiscovered burials. Such burials could be exposed during project-related ground-disturbing activities. There is, therefore, the possibility that the proposed project could affect human remains

However, as discussed in the *Livermore Stream Maintenance Program Manual* (ICF International 2013), ground-disturbing activities conducted under this SMP must comply with federal, state, and local laws and policies protecting cultural resources and human remains, including laws regarding the treatment of Native American remains. Compliance with these regulations will be met through the programmatic permitting for the SMP. SMP BMP measure CR-1 requires site investigations and cultural resource monitoring and BMP measure CR-2 requires proper treatment of human remains. Implementation of these SMP BMPs would reduce this impacts related to human remains to a less than significant level.

d. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than significant impact with SMP BMPs.

Proposed project activities include minimal ground disturbance associated with vegetation management and bank stabilization. Streams are located in alluvial areas and as such near-surface materials commonly consist of more recent quarternary materials that are not considered sensitive for significant paleontological resources because they are too young in age. In addition, SMP BMP CR-3 mandates actions in the unlikely event of inadvertent discovery of paleontological resources including assessment and treatment of encountered fossil materials, as appropriate. Given the low potential for significant paleontological resources within stream areas, the limited amount of excavation and with implementation of SMP BMPs, impacts to paleontological resources would be less than significant.

6. GEOPHYSICAL

Environmental Setting

Regional Geologic Context

The City of Livermore is located within the central portion of the Coast Ranges Geomorphic Province. In the San Francisco Bay Area (Bay Area), the Coast Ranges Province is characterized by a series of northwest-trending en-echelon ridges and valleys bounded by active faults of the San Andreas system, which forms the boundary between the Pacific and North American tectonic plates (Norris and Webb 1990). From west to east, these faults include the San Gregorio, the San Andreas, the Hayward-Rodgers Creek, Calaveras, Concord-Green Valley, Greenville, and Ortigalita, together with a number of smaller structures.

Geology of the Livermore Valley

The Livermore Valley, containing the cities of Livermore and Pleasanton, lies south and west of the Diablo Range and east of the East Bay Hills. This valley, an east-west trending valley, unique to this area, is a deep alluviated depression (Ollenburger 1986) containing sediments deposited as part of the Livermore Gravels Formation. The Greenville fault forms the eastern border of this valley, separating it from the western foothills of the Diablo Range. It is postulated that the Greenville Fault is connected to the Concord Fault at depth by a buried "blind" thrust fault system (Wetlands Research Associates 2004). It is this interaction of the Greenville and Concord Faults that has created the Mount Diablo uplift, a presently active (Crane 1995), Late Quaternary tectonic feature located in the north-central portion of the SMP Area. The bedrock structure of the Mount Diablo uplift is composed of rocks of the Miocene Green Valley/ Tassajara Formation and is postulated to contain deposits of the Livermore Gravels Formation (Graymer et al. 1996). The core of the Mount Diablo uplift, located just north of the plan area, contains

older Franciscan rocks, flanked by east- and westward-trending sedimentary strata of Eocene through Pliocene age.

Soils

The Livermore Valley floodplain supports very gravelly soils assigned to the Yolo-Pleasanton association, interspersed with loams and clays of the Rincon-San Ysidro association. The Natural Resources Conservation Service (NRCS) has classified all soils into four hydrologic soil groups (A,B,C, and D) according to their infiltration rate, which correlates to its ability to absorb and transmit water; this aids in the determination of total runoff. Much of Livermore was built on soils with hydrologic group B, which allows moderate infiltration rates. However, areas in the northeast and southwest are classified group D, which have very slow infiltration rates and will increase the amount of runoff. The soil along the northern edge of Livermore is in group C which also has a slow infiltration rate. The varied geologic settings affect the magnitude of flood risk experienced throughout the City (Schaaf & Wheeler 2004).

Impact Analysis

Would the proposal result in or expose people to potential impacts involving:

a. Seismicity: fault rupture, ground shaking or liquefaction?

No Impact.

Livermore is located in a seismically active region and, like all construction in the San Francisco Bay area, would be subject to potentially severe ground shaking during a major earthquake on an active fault in the region. Planned activities under the Stream Maintenance Program would not alter or change the effects of earthquakes on local streams relating to fault rupture, ground shaking or liquefaction. No habitable structures are proposed as part of the project.

b. Landslides or mudslides?

No Impact.

Local topography is generally flat with areas of smaller hills. Proposed maintenance activities include stream bank stabilization, as necessary, which will reduce the potential for landslides or mudslides in adjacent areas.

c. An increase in soil erosion, either on or off the site?

No Impact.

Local topography is generally flat with areas of smaller hills. Proposed maintenance activities include stream bank stabilization, as necessary, which will avoid soil erosion either within the stream channels or adjacent areas.

d. Changes in topography or unstable soil conditions from excavation, grading, or fill?

Less than Significant Impact.

The proposed project includes sediment removal primarily in areas adjacent to existing bridges, storm drain outlets, and culverts and bank stabilization as necessary. These activities will re-establish stream channel capacity and prevent future erosion.

e. Subsidence of land?

No Impact.

Subsidence is the gradual, local settling or sinking of the earth's surface with little or no horizontal motion. Subsidence usually results from gas, oil, or water extraction, hydrocompaction, or peat oxidation. None of these conditions is associated with the project or site.

f. Expansive soils?

No Impact.

The soils in the Livermore area are generally stable soils with low expansion potential.

g. Unique geologic or physical features?

No Impact.

There are no such features on the site.

7. GREENHOUSE GAS EMISSIONS

This section provides an analysis of GHG impacts resulting from the proposed project. It provides a broad overview of climate change science and summarizes the overall regulatory framework for GHG emissions and climate change. Environmental impacts related to GHG emissions, as well as mitigation measures to reduce or eliminate potential impacts, are also discussed. Please refer to Section 3 for a discussion of criteria pollutant impacts.

Environmental Setting

Climate Change Science

Climate change is a term used to describe large-scale shifts in existing patterns in the earth's climate system. Although the climate has historically responded to natural drivers, recent climate change has been unequivocally linked to increasing concentrations of GHGs in earth's lower atmosphere (Intergovernmental Panel on Climate Change 2007a). The rapid loading of GHGs into the atmosphere is primarily due to the burning of fossil fuels since the industrial revolution.

Higher concentrations of heat-trapping GHGs in the atmosphere result in increasing global surface temperatures, a phenomenon commonly referred to as global warming. Warming of the earth's lower atmosphere induces large-scale changes in planetary systems, including ocean circulation patterns, precipitation patterns, global ice cover, and biological distributions (Intergovernmental Panel on Climate Change 2007a, b).

The most common GHGs resulting from human activity are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). State CEQA Guidelines also define GHGs to include perfluorinated carbons (PFCs), sulfur hexafluoride (SF6), and hydrofluorocarbons (HFCs). Unlike criteria air pollutants, which occur locally or regionally, the long atmospheric lifetimes of these GHGs allow them to be well-mixed in the atmosphere and transported over distances. Key characteristics of GHGs associated with the project are summarized in Table 6. Generally, GHG emissions are quantified in terms of (MT) of carbon dioxide equivalents (CO_2e) emitted per year.

Table 6. Key Characteristics of Principle Greenhouse Gases

GHG	Primary Emissions Sources	Global Warming Potential (GWP)[a]	Atmospheric Lifetime (yr)[b]	Atmospheric Abundance (2005)
Carbon dioxide (CO_2)	• Burning of fossil fuels • Gas flaring • Cement production • Land use change	1	50-200	391 ppm
Methane (CH_4)	• Burning of fossil fuels • Agriculture processes • Livestock • Landfill outgassing • Land use change	21	9-15	1,871 ppb
Nitrous oxide (N_2O)	• Burning of fossil fuels • Agriculture processes • Nitric acid production • Nylon production	310	120	323 ppb

Notes
ppm = parts per million
ppb = parts per billion
ppt = parts per trillion
[a] The GWP is used to describe emissions of GHGs in terms of a single gas, known as CO_2e. GHGs are expressed as CO_2e by normalizing emissions to CO_2, which as a GWP of 1.
[b] Defined as the half-life of the gas.
Sources: Intergovernmental Panel on Climate Change 2007a; Carbon Dioxide Information Analysis Center 2012

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Increases in anthropogenic GHG emissions have been unequivocally linked to recent warming and climate shifts. Although modeling indicates that climate change will result globally and regionally, there remains uncertainty with regard to characterizing the precise *local* climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty in precise predictions, it is widely understood that substantial climate change is expected to occur in the future.

Greenhouse Gas Emissions Inventories

A GHG inventory is a quantification of all GHG emissions and sinks within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (i.e., for global and national entities) or on a small scale (i.e., for a particular building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources. Table 7outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 7. Global, National, Stat, and Local GHG Emissions Inventories

Inventory	Emissions (CO_2e)
2004 IPCC Global GHG Emissions Inventory	49,000,000,000
2011 EPA National GHG Emissions Inventory	6,702,000,000
2010 ARB State GHG Emissions Inventory	451,600,000
2007 BAAQMD San Francisco Bay Area GHG Emissions Inventory	95,800,000
2005 Livermore Community GHG Emissions Inventory	692,000
Source: IPCC 2007b; U.S. Environmental Protection Agency 2013; California Air Resources Board 2013; Bay Area Air Quality Management District 2010; City of Livermore 2009.	

Climate Change Regulations

Federal regulation on climate change under the federal Clean Air Act (CAA) is under development, with the EPA in a lead role. California has adopted statewide legislation addressing various aspects of climate change and GHG emissions mitigation. Much of this establishes a broad framework for the state's long-term GHG reduction and climate change adaptation program. Of particular importance is AB 32, which establishes a statewide goal to reduce GHG emissions back to 1990 levels by 2020. The Governor has also issued several executive orders related to the state's evolving climate change policy.

The City of Livermore is creating a Climate Action Plan (CAP), as per the adopted policies of the City's General Plan Climate Change Element (City of Livermore 2009) to take responsibility for the GHG emissions produced by the community and outline steps that will lessen future emissions. The goal is to reduce GHGs emitted from the City to a level 15 percent below 2008 conditions by 2020. The CAP will include specific incentives, actions, and requirements to reduce GHGs produced by City agencies, private businesses, and public agencies. Finalization of the CAP is expected in late 2013.

Greenhouse Gas Significance Thresholds

As discussed in Section 3, Air Quality, the BAAQMD has the primary responsibility for air quality management within Alameda County. The BAAQMD directs lead agencies to quantify and disclose GHG emissions and make a determination on the significance of GHG impacts in relation to meeting AB 32 GHG reduction goals. To assist in this determination, the air district has established quantitative thresholds for land-use development and stationary source projects. While the project does not propose new development (e.g., single-family homes) or stationary sources (e.g., generators), the BAAQMD's land-use development threshold of 1,100 metric tons CO_2e per year is used to evaluate the significance of project-generated emissions. This threshold was selected as it is the more stringent of the two BAAQMD thresholds (stationary source threshold is 10,000 metric tons CO_2e) (Bay Area Air Quality Management District 2011).

Impact Analysis

Would the proposal:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant Impact.

Implementation of the project would generate emissions of CO_2, CH_4, and N_2O over the course of the 10-year permit period. Emissions would originate from the use of equipment (e.g., graders) and on-

road vehicles (e.g., employee commuter cars and haul trucks). Initially, the project may slightly increase water consumption, relative to existing conditions, to support planting. However, long-term implementation of the SMP will likely reduce annual water consumption, relative to existing conditions, as a result of root establishment and reduced irrigation (Lung pers. comm.). Indirect GHG emissions associated with water consumption were not quantified as implementation of the project would likely reduce long-term emissions. Estimating actual water demand from vegetation management would also be speculative and require site-specific climatic data (e.g., temperature, humidity, precipitation) that are beyond the scope of this analysis. Potential effects on carbon stock/sequestration as a result of vegetation management are also not evaluated quantitatively. Vegetation management primarily entails selective trimming and pruning, which will not substantially affect the carbon sequestration capacity of the SMP Area. Tree removal will also be limited to sick, dying, or dead trees.

GHG emissions generated by the SMP components identified in Section III, Air Quality, were estimated using emission factors provided by CalEEMod (version 2011.1.1) and EMFAC2011. Table 8 summarizes the results of the emissions modeling. Please refer to Appendix A for additional analysis assumptions.

Table 8. Estimated Greenhouse Gas Emissions from Project Implementation (metric tons per year)

Period	Offroad Equipment			Onroad Vehicles		CO_2e
	CO_2	CH_4	N_2O	CO_2	Other[a]	
Construction Period[b]	19.24	0.00	0.00	2.66	0.05	22.14
Habitat Restoration	7.47	0.00	0.00	0.08	0.00	8
Total Annual Emissions	26.71	0.00	0.00	2.74	0.05	29.77
Total Permit Emissions[c]	267.11	0.03	0.01	27.37	0.54	297.71
BAAQMD Threshold	–	–	–	–	–	1,100

Notes:
[a] Includes CH_4, N_2O, and other trace GHGs emitted by onroad vehicles.
[b] Assumes implementation all project components except habitat restoration.
[c] Based on a permit lifetime of 10 years.

As shown in Table 8, implementation of the project would generate 30 metric tons of CO_2e per year. Over the course of the 10-year permit lifetime, the project would result in approximately 298 metric tons of CO_2e. This is equivalent to adding 60 typical passenger vehicles to the road during the permit period (U.S. Environmental Protection Agency 2011) and represents about 0.043% of Livermore's 2005 GHG inventory. Annual GHG emissions (30 metric tons) are also well below the BAAQMD's 1,100 metric ton CO_2e threshold, as would total emissions over the course of the 10-year permit lifetime. Accordingly, no mitigation is required; this impact is considered less than significant.

b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact.

As discussed in the setting above, the City has not yet adopted a qualified GHG Reduction Strategy, so consistency with such a plan cannot be analyzed. A CAP that is intended to fulfill this role is currently being prepared, but is not yet adopted or available. In the interim, the project is assessed against the City's General Plan Climate Change Element and AB 32.

The Climate Change Element largely includes policies intended to be implemented on a City-wide level or for City properties and processes. The document identifies BMPs for new developments of 50 residential units or greater and/or 50,000 square feet of commercial/ industrial use. These BMPs are primarily related to energy efficiency, renewable energy, transit, and waste generation. The proposed project is neither a residential nor commercial development. Consequently, none of the BMPs outlined in the Climate Action Element are applicable to the project.

The ARB adopted the AB 32 Scoping Plan as a framework for achieving AB 32. The Scoping Plan outlines a series of technologically feasible and cost-effective measures to reduce statewide GHG emissions. These strategies are geared towards sectors and activities that generate significant amounts of GHGs. For example, the majority of measures address building, energy, waste and wastewater generation, goods movement, water usage, and high global warming potential gases. Activities associated with the project are not considered by the AB 32 Scoping Plan as having a high potential to emit GHGs. This statement is substantiated by the project-level emissions analysis, which demonstrates that the GHG emission rate is low (30 metric tons CO_2e per year or 298 metric tons CO_2e over the course of the 10-year permit period). Consequently, none of the AB 32 reduction strategies are applicable to the project.

Based on the above analysis, the project would not conflict with implementation of AB 32 or the City's Climate Change Element. This impact is therefore considered less than significant.

8. HAZARDS

Would the proposal involve:

a. A risk of accidental explosion or release of hazardous substances (including but not limited to oil, pesticides, chemicals or radiation)?

Less than Significant Impact.

Maintenance activities conducted as part of the project will require mechanical equipment that uses fuel and lubricants and possibly the application of herbicides and pesticides that are hazardous to people and the environment if misused. If such fuels, lubricants, or other chemicals were accidently spilled, potential contamination of the area's water and soil could result. BMPs included in the project include detailed procedures to ensure that all equipment is properly maintained and handled to minimize the risk of environmental contamination. Procedures to respond to accidental spills or discovery of previously unknown contamination will be implemented as part of a Spill Prevention and Response Plan. This plan is also a requirement of the NPDES Construction General Permit. BMP measures relating to the use of herbicides will ensure the use and handling of herbicides for maintenance activities is consistent with federal, state and local regulations.

b. Possible interference with an emergency response plan or emergency evacuation plan?

No Impact.

Maintenance activities will not require the closure of, nor affect the access to, adjacent streets and therefore would not interfere with emergency vehicle response or emergency evacuation plans.

c. The creation of any health hazard or potential health hazard, or exposure of people to existing sources of potential health hazards?

Less than Significant Impact.

See response to a. above.

d. Increased fire hazard in areas with flammable brush, grass or trees?

Less than Significant Impact.

Maintenance activities will be conducted during the dry season, as period when the threat of wildland fire is the highest. Equipment used for maintenance activities use flammable fuels and lubricants. The project includes BMP measures to reduce the risk of fire ignition during maintenance activities, such as the required use of spark arrestors for internal combustion engines, fire suppression equipment available at the work site, and separations between flammable materials and the use of internal combustions engines.

9. LAND USE AND PLANNING

Environmental Setting

The City of Livermore is entirely within an Urban Growth Boundary (UGB). The UGB was established in order to protect agricultural and natural resources and to prevent future urban development outside Livermore (City of Livermore 2004). The UGB was finalized after two initiatives were passed. The first, passed by local voters in March of 2000, is the *South Livermore Urban Growth Boundary Initiative*, which defines the UGB around the southern portion of the city (City of Livermore 2004). The second, passed by the Livermore City Council in December of 2002, is the *North Livermore Urban Growth Boundary Initiative*, and defines the UGB around the northern portion of Livermore (City of Livermore 2004).

A fairly wide mix of land uses characterizes Livermore. There are areas of protected watersheds and open space, creeks flow through lower-density hillside residential areas and through increasingly dense residential areas mixed with commercial and industrial uses. Most residential areas retain some open space in the form of lawns and gardens, and public parks are scattered throughout the City (Schaaf & Wheeler 2004).

Although open space is scattered throughout the City, particularly near the creeks, the vast majority of Livermore has been urbanized. The City is experiencing new development around its edges, primarily in the northeast and northwest. While expansion has nearly met the current urban growth boundaries, there are still several parcels within the City that are currently undeveloped (Schaaf & Wheeler 2004).

Impact Analysis

Would the proposal:

a. Conflict with general plan designation or zoning?

No Impact.

Creeks and channels are generally designated as Open Space. Areas adjacent to creeks and channels have a variety of urban, rural, agricultural and open space designations. Creeks and channels are generally zoned OS-F (Open Space-Flood Plain). Areas adjacent to creeks and channels have a variety of zoning districts consistent with General Plan land use designations. Stream maintenance activities are consistent with existing General Plan designations and zoning.

b. Conflict with General Plan policies, or other applicable plans or policies adopted by the City or by other agencies with jurisdiction over the project?

Less than Significant Impact.

The Livermore General Plan includes the following goals, objectives and policies relating to streams and riparian habitats.

Goal OSC-1 Conserve the value and function of Livermore's open space as a biological resource.

Objective OSC-1.2 Minimize impacts to sensitive natural habitats including alkali sinks, riparian vegetation, wetlands and woodland forest.

Policy P2 Use and development of riparian areas should enhance the appearance of the creekside environment and protect and enhance native vegetation.

Goal OCS-2 Conserve Livermore's waterways, tributaries and associated riparian habitats.

Objective OSC-2.1 Continue efforts to ensure that development does not harm the quality or quantity of Livermore's surface or ground water.

Policy P1 Require the implementation of Best Management Practices (BMPs) to minimize erosion, sedimentation, and water quality degradation resulting from the construction of new impervious surfaces.

The primary purpose of the SMP is to provide an efficient and organized program to conduct stream maintenance activities, comply with all relevant environmental regulations, and maintain flood capacity while enhancing the area's natural resources. Maintenance Principles, Best Management Practices and mitigation measures relating to potential habitat and species reduce potential impacts to riparian resources and protect the natural creekside environment consistent with General Plan policies.

c. Disrupt or divide the physical arrangement of an established neighborhood?

No Impact.

Maintenance activities will occur within existing stream corridors and will not affect adjacent land uses and neighborhoods.

10. MINERAL RESOURCES

Would the proposal:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?

No Impact.

Sand and gravel resources of statewide importance exist in the quarry areas between Livermore and Pleasanton. No stream maintenance activities are proposed in identified quarry areas.

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?

No Impact.

See 10.a. above.

11. NOISE

Would the proposal result in:

a. Increases in existing noise levels?

Less than Significant Impact.

Stream maintenance activities, including sediment and vegetation removal, require the use of power tools and heavy equipment. Good Neighbor Policies included in the SMP require that all power equipment is equipped with original manufacturer's sound control devices or alternate sound control that is no less effective than the original equipment. In addition, all activities will adhere to the City's Noise Ordinance in terms of noise levels and hours of operation.

b. Exposure of people to severe noise levels?

No Impact.

See 11.a. above.

12. POPULATION AND HOUSING

Would the proposal:

a. Cumulatively exceed official regional or local population projections?

No Impact.

The project involves the maintenance of existing stream corridors within the City and would not affect or change adjacent existing or planned land uses. Therefore, the project will not affect the City's or regional population growth projections.

b. Induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure)?

No Impact.

The proposed project does not include the development of new infrastructure or the extension of existing major infrastructure. The project would not affect the development of currently undeveloped areas within the City.

c. Displace existing housing, especially affordable housing?

No Impact.

The project involves the maintenance of existing stream corridors within the City and would not affect or change adjacent existing or planned land uses. The project would not involve the removal or displacement of existing development, including housing.

d. Create a substantial jobs/housing imbalance?

No Impact.

The project involves the maintenance of existing stream corridors within the City and would not affect or change adjacent existing or planned land uses. The project would not affect existing or projected jobs and housing.

13. PUBLIC SERVICES

Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas:

a. Fire and Police protection?

Less than Significant Impact.

The project involves maintenance of existing stream corridors within the City. Best Management Practices require fire prevention measures for the use of internal combustion engines.

b. Schools?

Less than Significant Impact.

The project involves maintenance of existing stream corridors within the City. Maintenance activities may occur adjacent to schools located along stream corridors. Best Management Practices relating to noise, timing of activities (primarily during summer months), and hours of operation will reduce potential impacts to adjacent schools to less than significant.

c. Maintenance of public facilities, including roads?

No impact.

The project involves maintenance of existing stream corridors within the City. The project will not affect the maintenance of other public facilities, such as roads and buildings.

d. Other governmental services?

No Impact.

The project involves maintenance of existing stream corridors within the City. The project will not affect the provision of other public services within the City.

14. RECREATION

Would the proposal:

a. Increase the demand for neighborhood or regional parks or other recreational facilities, or affect existing recreational opportunities?

Less than Significant Impact.

The project involves the maintenance of existing stream corridors within the City. The project will not increase the demand for recreational facilities. However, the project may require the temporary closure of trails adjacent to the stream corridors during maintenance activities.

The SMP requires use of BMPs which ensure that significant impacts do not occur. These SMP BMPs include BMP GN-1, GN-2, GN-3, GN-4, and GN-5. As such, impacts to recreational opportunities would be less than significant.

15. TRANSPORTATION/CIRCULATION

Would the proposal result in:

a. Increased vehicle trips or traffic congestion?

Less Than Significant Impact.

Minimal additional traffic trips associated with the project includes trips from employees, heavy equipment delivery and haul trucks, depending on the type and location of maintenance activity. Work will be conducted in a manner to maintain access along adjacent roadways to the extent feasible. Best Management Practices require that if road closures are necessary, they would be scheduled outside of peak traffic hours (7:00 to 10:00 am and 3:00 to 6:00 pm). Advance warning will be provided to adjacent residents and businesses, detour routes identified, and flaggers provided.

b. Hazards to safety from design features (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?

No Impact.

The project involves maintenance of stream corridors within the City. No new roadways are includes with the project.

c. Inadequate emergency access or access to nearby uses?

Less than Significant Impact.

The project involves maintenance of stream corridors within the City. No new roadways are includes with the project.

The SMP requires use of BMP GN-4. As such, impacts to emergency access and other nearby uses would be less than significant.

d. Insufficient parking capacity on-site or off-site?

No Impact.

The project involves maintenance of stream corridors within the City. Temporary employee and equipment parking will be identified as needed for the maintenance activities.

e. Hazards or barriers for pedestrians or bicyclists?

Less than Significant Impact.

The project involves the maintenance of existing stream corridors within the City. The project may require the temporary closure of trails adjacent to the stream corridors during maintenance activities. Standard construction practices would be applied to City projects which include postage of closure signs and barrier fencing as necessary to safely route bicyclists and pedestrians around construction areas.

f. Conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

No Impact.

The project involves the maintenance of stream corridors within the City. Maintenance activities will not affect existing or planned alternative transportation, such as bus turnouts.

g. Rail, waterborne, or air traffic impacts?

No Impact.

The project involves the maintenance of stream corridors within the City. Maintenance activities will not affect existing rail or air traffic.

16. UTILITIES AND SERVICE SYSTEMS

Would the proposal result in a need for new systems, or substantial alterations to the following utilities:

a. Power or natural gas?

No Impact.

The project involves the maintenance of stream corridors within the City. The maintenance activities will not require new, or alterations to existing, power or natural gas systems.

b. Communication systems?

No Impact.

The project involves the maintenance of stream corridors within the City. The maintenance activities will not require new, or alterations to existing, communication systems.

c. Local or regional water treatment or distribution facilities?

No Impact.

The project involves the maintenance of stream corridors within the City. The maintenance activities will not require new, or alterations to existing, water treatment or distribution systems.

d. Sewer or septic tanks?

No Impact.

The project involves the maintenance of stream corridors within the City. The maintenance activities will not require new, or alterations to existing, sewer or septic systems.

e. Storm water drainage?

Less Than Significant Impact.

The project occasionally involves maintenance of storm water infrastructure located in and along streams maintained under the SMP. For example, some bank failures are caused by erosion around or across from storm drain inlets. Repairs to storm drain outlets would allow the storm drain system to work more effectively and efficiently.

Use of maintenance equipment, including heavy equipment, in flood control channels is required for sediment removal and bank stabilization maintenance activities. If equipment were to be left in a flood control channel during a storm event that could affect the channel's ability to convey flood flows. Similarly, the Program occasionally requires stockpiling of materials to be used for stream repair or materials recently removed from the channel. If stockpiles were left in a flood control channel during a storm event that could affect the channel's ability to convey flood flows.

The SMP requires use of BMP GEN-1 and GEN-2. As such, impacts to storm water drainage would be less than significant.

f. Solid waste disposal?

Less Than Significant Impact.

Sediment removed from the stream corridors will be used on-site where possible and allowable or for other projects nearby. If it is unsuitable for use locally, it will be hauled off-site to a suitable upland disposal site or to the Altamont Landfill. It is anticipated that the project will involve removing between 1,000 and 2,000 cubic yards of sediment per year; the Holmes Street bridge average gravel removal alone accounts for approximately 1,000 cubic yards of sediment.

g. Create light or glare?

No Impact.

The project involves the maintenance of stream corridors within the City. Maintenance activities will occur during daylight hours and will not require the use of temporary lighting.

17. WATER QUALITY AND HYDROLOGY

Descriptions of key water quality parameters in relation to surface water and groundwater quality are provided in the following sections. Depending on the available information, local groundwater quality and surface water quality are described in more detail below.

Environmental Setting

Surface Water Quality

The USGS and SFBRWQCB have monitored water quality within the SMP Area. The USGS monitored four sites along the Arroyo Las Positas for water quality during the early 1980s (U.S. Geological Survey 2004). Four sites within the SMP Area were monitored in 2001 and 2002 by the SFBRWQCB (2004). Using additional sources and locations, Zone 7 has created a water flow record back to 1912 and water quality data back to 1948. These data suggest that the water quality of the Arroyo Las Positas has remained relatively unchanged throughout the past 20 years. Water quality objectives are being met for most constituents. Total dissolved solids (TDS) thresholds, however, are exceeded regularly, and the water is high in chlorides. Alkaline soils in natural sections of the creek are a contributing factor of the elevated TDS levels. Existing erosion of bed and banks is also contributing sediment to the creek.

Extensive water quality data were not available for the Arroyo Mocho or Cottonwood Creek. However, the water quality is expected to reflect the land uses in the watershed. Land uses surrounding the creeks include open space, urban/industrial, and agricultural uses. Open space is not anticipated to contribute pollutants to water bodies above background levels, except when it includes grazing, which would typically contribute sediment, nutrients, and bacteria. Urban and agricultural land uses typically contribute sediment, hydrocarbons and metals, pesticides, nutrients, bacteria, and trash. The proposed land uses would be expected to contribute similar contaminants.

Both the Arroyo Las Positas and the Arroyo Mocho are listed as highly impaired water bodies under Section 303(d) of the CWA for diazinon from urban runoff and storm drains. Moving downstream, the Arroyo de la Laguna and Alameda Creek are both highly impaired for diazinon from urban runoff and storm drains. The southern San Francisco Bay, the receiving waters for Alameda Creek, is impaired by a number of constituents.

Groundwater Quality

Groundwater quality is highly variable throughout the Livermore Valley groundwater basin. Zone 7 actively monitors the groundwater quality of the basin. There has been a net increase in TDS, and the associated salt content, over time. Based on the 1974 baseline of storage volume and salt concentration, as well as annual fluxes in recharge and salts, estimates of the 2005 theoretical TDS basin-wide is 710 milligrams per liter (mg/L) (Jones & Stokes 2006a). At two key wells monitored by Zone 7 over the past ten years, actual TDS levels have fluctuated between 410 to 790 mg/L with most of the records between 470 to 620 mg/L. (Jones & Stokes 2006a.) Zone 7 has identified recharge of local streamflow, recharge of imported water, subsurface inflow, and irrigation return flows as major sources of salt to the main basin. Elevated nitrate plumes occur in the central and eastern valley from livestock manure and the historic usage of septic tanks. For the Amador subbasin, waters are of good to excellent quality, characterized by sodium bicarbonate, magnesium bicarbonate, and calcium bicarbonate with a few instances of elevated levels of boron (likely from natural sources in soils) and nitrate (likely from agricultural contributions).

Impact Analysis

Would the proposal:

a. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?

Less Than Significant Impact.

The project involves the maintenance of stream corridors within the City. The project will not affect the drainage pattern of surrounding lands, or the rate and amount of surface runoff entering flood control channels.

Removal of sediment from the channel invert in natural-bottomed channels may facilitate increased percolation of flows. However, channels will be maintained up to the as-built design and will not support percolation beyond that established by the channel design.

b. Exposure of people or property to flooding?

Less Than Significant Impact.

The central purpose of the SMP is to provide a process for maintaining flood capacity while enhancing the area's natural resources. The SMP is designed to reduce the exposure of people or property to flooding. However, use of maintenance equipment, including heavy equipment, in flood control channels is required for sediment removal and bank stabilization maintenance activities. If equipment were to be left in a flood control channel during a storm event that could affect the channel's ability to convey flood flows. Similarly, the Program occasionally requires stockpiling of materials to be used for stream repair or materials recently removed from the channel. If stockpiles were left in a flood control channel during a storm event that could affect the channel's ability to convey flood flows.

The SMP requires implementation of BMP GEN-1 and GEN-2 which would avoid the potential for temporary impediments to streamflow. As such, impacts associated with exposure of people or property to flooding would be less than significant.

c. Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity)?

Less Than Significant Impact.

The project involves the maintenance of stream corridors (i.e., surface waters) within the City. The main SMP activities include sediment removal, bank stabilization, and vegetation removal, and occur within stream channels that convey surface flows.

The SMP requires multiple BMPs, the implementation of which would avoid adverse impacts to water quality during maintenance activities. These include BMPs GEN-1, GEN-2, GEN-3, HAZ-1, HAZ-2, HAZ-3, HAZ-4, HAZ-5, VEG-3, VEG-5, WQ-1, WQ-1, WQ-2, WQ-3, and WQ-4. As such, impacts to water quality would be less than significant.

d. Change the quantity, or direction or rate of flow of groundwater through direct additions or withdrawals or through interception of an aquifer by cuts or excavations, or impacts to groundwater quality?

No Impact.

The project involves the maintenance of surficial stream corridors within the City. Maintenance activities do not include percolation or extraction of groundwater.

18. MANDATORY FINDINGS OF SIGNIFICANCE

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, 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?

No.

b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?

No.

c. 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.)

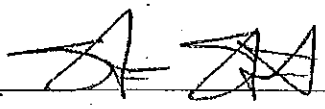
No.

d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

No.

DETERMINATION

Although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because of the SMP Mitigation Program and the additional mitigation measure described herein that has been added to the project. A Mitigated Negative Declaration will be prepared.

Signature: 

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Date: April 7, 2015

SOURCES:

Contributors

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Appendix A
Air Quality and Greenhouse Gas Modeling Details

This appendix summarizes the assumptions used to assess criteria pollutant and GHG emissions associated with implementation of the project. The analysis evaluates maximum daily criteria pollutants and annual GHG emissions to comply with BAAQMD (2011) *CEQA Guidelines*.

Schedule and Phasing

Implementation of the SMP includes nine components that will be implemented annually over the 10-year permit period. Table A-1 outlines the assumed implementation schedule, components, and associated tasks for the purpose of air quality and greenhouse gas emissions modeling. The actual amount of working days may vary, but this is considered a reasonable estimate.

Table A-1. Implementation Schedule and Activities

Component	Implementation Period	Working Days	Potential Task(s)
Sediment Removal	June – September	7	Removal of accumulated sediment; installation of access ramps; placement of riprap; flushing of drains
Vegetation Management	June – September	10	Routine pruning and vegetation removal; planting and watering
Bank Stabilization	June – September	7	Repair and stabilization of eroded streams
Bridge Maintenance	June – September	7	Repairs to existing bridges; graffiti removal; cleaning
Road Maintenance	June – September	7	Grading and resurfacing of existing access roads
Habitat Restoration	October	7	Wetland and upland enhancement and restoration, including planting, watering, vegetation removal, and data collection
Culvert Repair	January – December	7	Installation of drop-inlet culverts; cleaning or replacement of road crossing culverts
Trash Removal	January – December	7	Removal of trash and debris
Reconnaissance	January – December	7	Site visits and work plan development

As shown in Table A-1, it was assumed that activities during several components will occur concurrently. However, this may not occur due to limitations on staff and equipment. To evaluate maximum emissions levels associated with project implementation, it was assumed that during these periods of overlap, all equipment would operate at the same time. Table A-2 identifies the implementation periods evaluated in the emissions analysis. Daily emissions estimates for individual components occurring in each implementation period were added to obtain the maximum total project-related air quality impact.

Table A-2. Implementation Periods Evaluated in the Emissions Analysis

Implementation Period	Associated Components
Construction Season (June-September)	Sediment Removal, Vegetation Management,Bank Stabilization, Culvert Repair Bridge Maintenance, Road Maintenance, Trash Removal, Reconnaissance
Restoration (October)	Habitat Restoration

Emissions Calculations

Emissions from heavy-duty equipment were estimated using emission factors generated by the CalEEMod (version 2011.1.1) emissions model. Table A-3 summarizes the off-road equipment assumed in the emissions modeling. As noted in Chapter 2, *Project Description*, all equipment would comply with the BAAQMD's basic and enhanced construction mitigation measures. Equipment horsepower were based on CalEEMod default values. However, default load factors within CalEEMod have been replaced with updated load factors from the revised Carl Moyer Program Guidelines, which were approved by the ARB on April 28, 2011 (California Air Resources Board 2011:236-237). A conservative operating assumption of eight hours per day was assumed for all equipment.

Table A-3. Off-Road Equipment Modeling Assumptions

Phase	Equipment	Number per Day	Horsepower	Load Factor
Sediment Removal	Bulldozer	2	250	0.40
	Loader	2	120	0.37
Bank Stabilization	Excavator	1	175	0.38
Bridge Maintenance	Excavator	1	175	0.38
Culvert Repair	Excavator	1	175	0.38
Habitat Restoration	Scraper	1	250	0.48
	Small Loader	1	120	0.37
Road Maintenance	Grader	1	175	0.41
	Loader	1	120	0.37

Note: The following components would not require heavy-equipment: Vegetation Management; Trash Removal; Reconnaissance. All activities were assumed to utilize hand tools and other non-motorized equipment.
Source: Lung pers. comm.

In addition to off-road equipment, project implementation would require on-road vehicles for employee commute trips and hauling. Emissions from mobile sources were estimated using emission factors generated by the ARB's EMFAC2011 emissions model. Table A-4 summarizes the vehicle trip data used in the emissions modeling. A trip distance of 12.4 miles was assumed for employee vehicle trips based on CalEEMod defaults for "home-based-work" trips in the BAAQMD. Haul truck trips were assumed to be 5 miles, based on information provided by the project applicant (Lung pers. comm.).

Table A-4. On-Road Modeling Assumptions

Phase	Roundtrip Employee Trips per Day	Haul Truck Trips Max Daily	Haul Truck Trips Annual
Sediment Removal	5	15	100
Vegetation Management	2	0	0
Bank Stabilization	5	13	13
Bridge Maintenance	2	0	0
Culvert Repair	2	0	0
Habitat Restoration	2	1	1
Trash Removal	2	1	1
Road Maintenance	2	0	0
Reconnaissance	2	0	0

Source: Lung pers. comm.

Fugitive dust emissions generated by land disturbance were estimated using emission factors developed by CalEEMod. Based on information provided by the project applicant, sediment removal and road maintenance could disturb up to 0.50 acre daily, whereas bank stabilization could disturb up to 0.25 acre (Lung pers. comm.).

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Lung, Pam. City of Livermore, Livermore, California. June 17, 2013—telephone call with Laura Yoon and Jeff Thomas, ICF International.

ERRATA

LIVERMORE STREAM MAINTENANCE PROGRAM AND INITIAL STUDY

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September 2015

ICF International. 2015. Errata: Livermore Stream Maintenance Program and Initial Study. September. (ICF 00337.12). Prepared for the City of Livermore, Livermore, CA.

Contents

Chapter 1
Introduction and Purpose

The Livermore Stream Maintenance Program and Initial Study Errata was developed to provide and describe updates and revisions to the Draft Livermore Stream Maintenance Program (SMP) manual. The Draft SMP was released for public comment in April 2015 along with its Initial Study and Proposed Mitigated Negative Declaration (IS/MND). In the course of addressing public comments on the IS/MND, modifications to the text of both the Livermore SMP and the Initial Study were implemented. This Errata presents the changes made to the Livermore SMP based on comments on the Initial Study, as well as revisions based on communications from other interested agencies who commented directly on the SMP.

This document is organized by document, and in the case of the SMP also by chapter, for ease of reference and comparison to the April 2015 Draft Livermore SMP and Initial Study. Each revision is proceeded by a brief introduction to the location and nature of the amended text. Changes from the April 2015 Draft SMP and Initial Study are indicated as follows: new text is shown in underline type; deleted text is shown as strikethrough.

Taken together, the April 2015 Draft Livermore SMP, the Initial Study, and this Livermore SMP Errata represent a Final Livermore SMP manual and the associated CEQA documents, dated September 2015.

Chapter 2
Livermore Stream Maintenance Program Errata

Chapters

Chapter 8 Program Mitigation

On page 8-2, the following text edit was made to the second paragraph under Section 8.2.2 2008 Final Rule.

> The 2008 Final Rule provides general compensatory mitigation guidance (33 CFR 332.3) for several key issues regarding mitigation planning including type and location of compensatory mitigation, using a watershed approach, site selection, mitigation type, and mitigation amount.

A new Section 8.2.2.1 Definitions *was added.*

8.2.2.1 Definitions

To ensure consistency in how proposed mitigation projects are described and evaluated to meet annual mitigation requirements, the SMP uses the same definitions as provided in the 2008 Final Rule as follows.

> ***Enhancement*** means the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.
>
> ***Establishment*** (creation) means the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions.
>
> ***Restoration*** means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.
>
> ***Re-establishment*** means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.
>
> ***Rehabilitation*** means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

On page 8-3, the second to last paragraph under Section 8.3 Mitigation Approach *was modified.*

The mitigation approach follows a three-tiered system where mitigation opportunities are sought first on-site at the project location (Tier 1), and second in other SMP Area reaches (Tier 2). Tier 1 and Tier 2 ~~M~~mitigation actions ~~implemented within the SMP Area on City-owned lands~~ will be protected in perpetuity through placement of a deed restriction, easement, or other equivalent mechanism. Tier 3 mitigation will occur regardless of the location of Tier 1 and 2 mitigation and is intended to address temporal loss. The City will work with the landowners of any Tier 3 projects to establish an acceptable form of permanent protection where the landowner is willing, although permanent protection of Tier 3 sites is not a requirement of this program. The three-tier mitigation approach ensures that mitigation is first and foremost directed to compensate for the impacts occurring at the specific project reach, then expanded if necessary to consider reaches within the SMP Area and the watershed as a whole should opportunities within the project reach be insufficient to compensate for impacts.

On page 8-4, the final paragraph under Section 8.3.1 Tier 1: On-site Mitigation within Impacted Reaches *was modified.*

As described below, Tier 1 mitigation activities may include a planting program to develop a fuller riparian corridor, the removal of exotic and invasive species, ~~and~~ or restoration and/or enhancement of geomorphic characteristics in stream channels (e.g., the ~~construction of low-flow channels~~addition of pools or riffles, addition of ~~and~~ other ~~geomorphic features to enhance~~ in-stream habitat features) or wetlands. ~~Tier 1 m~~Mitigation activities may include other actions as well, such as movement barrier removal, if opportunities exist and funding is available.

For sediment removal projects, restoration of channel structure at the sediment removal location to pre-project or functionally improved conditions is a regulatory requirement for those projects and is not considered mitigation.

On page 8-6, the final paragraph under Section 8.3.1.1 Planting Program, *subsection* Implementation *was modified.*

An irrigation plan will be developed annually that is specific to each proposed mitigation site. In general, irrigation systems will be installed where appropriate and hand watering will be used as an alternative. Trees and shrubs will be irrigated ~~manually~~ during the dry season for 3 years.

On page 8-7, Section 8.3.1.2 Geomorphic Design *was recharacterized.*

8.3.1.2 Restoration and Enhancement of Streams and Wetlands~~Geomorphic Design~~

In addition to the planting and invasive removal activities described above, the City may undertake restoration or enhancement projects of wetlands and waters to meet mitigation needs. This may include restoration and/or enhancement of geomorphic characteristics in stream channels (e.g., the addition of pools or riffles, addition of other in-stream habitat features, removal of barriers) or wetlands.

~~For reach-scale sediment removal projects, the City will design and implement a low-flow inset channel along the bed of the flood control channel. The low-flow channel provides on-site mitigation through multiple benefits. Because low-flow channels are implemented together with sediment removal activities, they are described in Chapter 5, Section 5.3.~~

~~A key objective of a low-flow channel is to successfully transport sediment under lower flow conditions (annual flows and smaller). This is achieved through increased flow depth and~~

~~velocity under low-flow conditions which are adequate to convey and pass sediments under the smaller flow conditions. This reduces sediment deposition, and ultimately reduces the need to conduct sediment removal activities. A sustainable low-flow channel also provides mitigating benefits of improving water quality, enhancing in-stream habitats, and preserving a migration corridor for fish.~~

On page 8-11, the first sentence of the second paragraph under Section 8.4 Mitigation Ratios *was modified.*

Mitigation ratios are defined, in part, for temporary and permanent impacts.

On page 8-11, the following paragraph was added under Section 8.4 Mitigation Ratios.

Mitigation ratios are also defined for impacts to waters of the U.S. and State by the type of mitigation proposed. Mitigation that meets the definition of establishment (creation) and re-establishment will have a lower mitigation ratio than those projects that meet the definition for enhancement or rehabilitation (see Section 8.2.2.1 above).

On page 8-11, the second paragraph under Section 8.4.1 Waters of the U.S. and State *was modified.*

The permanent mitigation ratio for impacts to waters of the U.S. or state will be restoration or creation at 1.5:1 (mitigation to impact), or enhancement at 2:1. Temporary impacts to waters of the U.S. or state will be mitigated at a ratio of 1.1:1 (mitigation to impact) through restoration or creation, and 1.5:1 through enhancement of the project site following the impacting SMP activity based on the three-tiered mitigation approach. If the site does not allow sufficient space to mitigate ~~temporary~~ impacts, the Tier 2 mitigation approach will be applied (i.e., off-site mitigation).

On page 8-12, the first paragraph under Section 8.4.2 Riparian Vegetation *was modified and the final paragraph was deleted.*

In order to ensure that implementation of the SMP results in no net loss of riparian vegetation functions and values, the City will mitigate for ~~permanent~~ impacts to riparian vegetation through ~~restoration, creation, and/or preservation~~ planting of new riparian vegetation. ~~Restoration, creation, and preservation o~~Opportunities for planting within the SMP Area include areas along the stream reaches covered by the SMP. ~~The m~~Mitigation ~~ratio~~ for loss of stems equal to or greater than 4" diameter at breast height (DBH) will require replacement of native riparian trees at a 3:1 (mitigation to impact) ratio, and at 1.5:1 for analog non-natives (i.e., non-native trees that provide native riparian habitat function). ~~permanent impacts will be 1.5:1 (mitigation to impact). This ratio applies to impacts to in-channel (the channel banks and creek bed),~~ Mitigation is not required for removal of ~~non~~-invasive ~~riparian~~ vegetation (see Table 5-1 for a list of Cal-~~ICP~~ IPC invasive species).

~~Temporary impacts to riparian vegetation will be mitigated at a ratio of 1.1:1 (mitigation to impact) following the impacting SMP activity based on the three-tiered mitigation approach.~~

Chapter 9 Program Management

On page 9-2, the first paragraph under Section 9.2 Creek and Channel Reconnaissance and Assessment *was modified.*

In the late winter or early spring, the City will initiate a reconnaissance of the stormwater drainage system included in the SMP on a reach-by-reach basis to assess potential maintenance needs. This reconnaissance will include monitoring of project sites where maintenance occurring in the previous 5 years involved ground disturbance. Staff will monitor these sites for geomorphic stability.

Tables

Item 2 in Best Management Practice BR-4 Impact Avoidance and Minimization During Dewatering *in Table 7-1* Stream Maintenance Program Best Management Practices *was modified to include an additional sentence.*

Pumps used to dewater coffer dams or to divert live stream flow around dewatered work areas shall be screened and maintained throughout the construction period to prevent the entrainment of amphibians or their larvae.

Chapter 3
Livermore Stream Maintenance Program Initial Study Errata

On page 2, a new final paragraph was included under Sediment Management.

For reach scale sediment removal projects, the City would design and implement a low-flow inset channel along the bed of the flood control channel. Low-flow channels would be implemented together with sediment removal activities. A key objective of a low-flow channel would be to successfully transport sediment under lower flow conditions (annual flows and smaller). This is achieved through increased flow depth and velocity under low-flow conditions which are adequate to convey and pass sediments under the lower flow conditions. This reduces sediment deposition, and ultimately reduces the need to conduct sediment removal activities. A sustainable low-flow channel would also improve water quality, enhance in-stream habitats, and enhance the stream's function as a migration corridor for fish.

Low-flow channel design (also sometimes referred to as geomorphic design) is required in the SMP for sediment removal projects and is a standard requirement for sediment removal projects that receive Water Board permits, but will not be counted as part of the mitigation "credit" required in the SMP unless it is part of a larger restoration or enhancement action.

On page 5, a typo was corrected in the third paragraph under Program Mitigation.

The SMP habitat mitigation activities would be implemented within a short time period following the SMP activities themselves (typically at the end of the maintenance season to take advantage of the wet season to support new plantings, but no more than one year from conclusion of the maintenance season).~~season~~ The following requirements would be met before impacts are allowed to occur:

On page 5, a clarification added to the first bullet under Program Mitigation.

- The annual mitigation plan requires the approval of the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFW), and San Francisco Bay Regional Water Quality Control Board (SFBRWQCB);

On page 7, the section previously called Low-Flow Channel Design was replaced.

~~Low-Flow Channel Design~~ Restoration and Enhancement of Streams and Wetlands

In addition to the planting and invasive removal activities described above, the City may undertake restoration or enhancement projects of wetlands and waters. This may include restoration and/or enhancement of geomorphic characteristics in stream channels (e.g., the addition of pools or riffles, addition of other in-stream habitat features, removal of barriers) or wetlands.

~~For reach scale sediment removal projects, the City would design and implement a low-flow inset channel along the bed of the flood control channel. Low-flow channels would be implemented together with sediment removal activities.~~

~~A key objective of a low-flow channel would be to successfully transport sediment under lower flow conditions (annual flows and smaller). This is achieved through increased flow depth and velocity under low-flow conditions which are adequate to convey and pass sediments under the smaller flow conditions. This reduces sediment deposition, and ultimately reduces the need to conduct sediment removal activities. A sustainable low-flow channel would also improve water quality, enhance in-stream habitats, and enhance the stream's function as a migration corridor for fish.~~

On page 9, a new bullet was added under Other Required Approvals.

- California Department of Transportation (Caltrans; Transportation Management Plan, transportation permit, and/or encroachment permit under certain conditions).

On page 32, edits were made to the second paragraph under Longhorn Fairy Shrimp *(Branchinecta longiantenna).*

For this analysis, longhorn fairy shrimp ~~is assumed to~~may exist ~~on all~~in seasonal wetland land cover types. There ~~is~~ are three documented occurrences of longhorn fairy shrimp in the species study area east and north of Brushy Creek Preserve in eastern Alameda and Contra Costa Counties (California Natural Diversity Database 2015). Seasonal wetland habitat in the SMP Area includes portions of Altamont Creek, Altamont Creek Tributary, Arroyo Las Positas, Arroyo Seco, Collier Canyon Creek, Cottonwood Creek, and an isolated reach in Bear Creek Basin. Based on habitat quality and the SMP Area's proximity to extant occurrences, potential for occurrence of ~~vernal pool~~longhorn fairy shrimp is considered very low.

On page 43, revisions were made to the fifth and sixth paragraphs under Riparian Habitat.

~~If impacts to riparian habitat cannot be avoided,~~ In order to ensure that implementation of the SMP results in no net loss of riparian habitat functions and values, the City will mitigate for ~~permanent~~ impacts to riparian habitat through ~~restoration, creation, and/or preservation~~planting of new riparian habitat. ~~Restoration, creation, and preservation o~~Opportunities for planting within the SMP Area include areas along the stream reaches covered by the SMP. ~~The m~~Mitigation ~~ratio~~ for ~~permanent impacts~~loss of stems equal to or greater than 4" diameter at breast height (DBH) will require replacement of native riparian trees at a~~be~~ ~~1.5~~3:1 (mitigation to impact) ratio, and at 1.5:1 for analog non-natives (i.e., non-native trees that provide native riparian habitat function). ~~This ratio applies to impacts to in-channel (the channel banks and creek bed), non-~~Mitigation is not required for removal of invasive ~~riparian~~ vegetation (see SMP Table 5-1 for a list of Cal-IPC invasive species). ~~The SFBRWQCB regulates impacts and mitigation for impacts to riparian habitat on a linear foot basis, as well as an acreage basis. Mitigation for riparian habitat habitats will be expressed both in units of acres and linear feet parallel to the direction of flow.~~

Temporary impacts to riparian habitat will be mitigated at a 1.1:1 ratio (mitigation to impact) following the impacting SMP activity ~~based~~.

On page 44, revisions were made to Mitigation Measure BIO-1: Springtown Alkali Sink Preservation, Restoration, and Management.

If impacts to the valley sink scrub habitat within the Springtown Alkali Sink cannot be avoided, the City shall restore or ~~preserve~~ create valley sink scrub habitat at a ratio of ~~1.5~~2:1 (mitigation to impact) for permanent impacts within the greater Springtown Alkali Sink area with

preference for habitat adjacent to the existing Springtown Sink Alkali Preserve[1]. Restored and/or ~~preserved~~ created habitat will be protected and managed similar the Springtown Alkali Sink Preserve.

On page 46, revisions were made to the text under Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

In order to ensure that implementation of the SMP results in no net loss of wetland and stream habitat functions and values, the City will compensate for ~~to~~ the loss of wetlands/waters through restoration and/or creation and enhancement of in-kind wetlands/waters within the greater Livermore area following the SMP's three-tiered mitigation approach. The City will mitigate for permanent impacts to wetlands/waters through restoration or, creation~~, and/or preservation~~ of wetlands/waters~~. The~~ at a ~~mitigation~~ ratio ~~for permanent impacts will be~~of 1.5:1 (mitigation to impact), or 2:1 for enhancement.

Temporary impacts to wetlands/waters will be mitigated through restoration or creation at a 1.1:1 ratio (mitigation to impact), or through enhancement at a 1.5:1 ratio, following the impacting SMP activity based on the Tier 1 mitigation approach. If the site does not allow sufficient space to mitigate temporary impacts, the mitigation ratio(s) will be met using the Tier 2 mitigation approach (i.e., off-site mitigation in the SMP Area). Mitigation actions will ensure that the functions and values of the stream reach are improved over pre-project conditions.

~~The SFBRWQCB regulates impacts and mitigation for impacts to~~ stream ~~habitat on a linear foot basis, as well as an acreage basis. Mitigation for~~ impacts to waters/wetlands ~~will be expressed both in units of acres and~~, for streams, ~~linear feet parallel to the direction of flow.~~

[1] This mitigation ratio only applies to impacts to the valley sink scrub land cover type when occurring within the Springtown Alkali Sink. If focal species are also impacted, they will be mitigated according to SMP Table 8-4. For example, if a bank stabilization project results in a permanent loss of 0.02 acre of valley sink scrub within the Springtown Alkali Sink in an area where vernal pool fairy shrimp are assumed to be located, then 0.13 acre of valley sink scrub would be preserved (at a 6.5:1 ratio to address both the land cover type impact as well as the vernal pool fairy shrimp impact) and 0.07 acre restored (at a 3.5:1 ratio to address the vernal pool fairy shrimp impact).

MITIGATION MONITORING AND REPORTING PROGRAM

LIVERMORE STREAM MAINTENANCE PROGRAM

(SCH# 2015042027)

City of Livermore, California

September 2015

ICF International. 2015. Mitigation Monitoring and Reporting Program for the Livermore Stream Maintenance Program. September. (ICF 00337.12.) San Rafael, CA. Prepared for City of Livermore, Livermore, CA.

Mitigation Monitoring and Reporting Program

1.0 Introduction

The California Environmental Quality Act (CEQA) requires that a Lead Agency establish a program to monitor and report on mitigation measures that it has adopted as part of the environmental review process, and that this program must be adopted at the time that the agency determines to carry out a project for which the environmental review process has been conducted (Public Resources Code Section 21081.6 (a) (1)). The City of Livermore (City) has prepared this Mitigation Monitoring and Reporting Program (MMRP) to ensure that mitigation measures identified in the Livermore Stream Maintenance Program (SMP) Mitigated Negative Declaration and Initial Study (IS/MND) are fully implemented during project implementation.

As the lead agency and proponent of this project, the City will implement the mitigation measures through its own actions and actions taken in cooperation with other agencies and entities with which a management agreement or other contract is established. The City is ultimately accountable for the overall administration of the mitigation and monitoring program and for assisting relevant individuals and parties in their oversight and reporting responsibilities.

2.0 Implementation Responsibilities

The City and Livermore Area Recreation and Parks Department (LARPD) are the two agencies that are expected to conduct activities under the SMP. Work will be coordinated between the City and LARPD through established management agreements, development of annual work plans, and accurate reporting as described below.

The City has defined the mitigation measures required for SMP implementation. The City and LARPD will each be responsible for implementing projects consistent with the SMP and annual work plans according to the following.

- Implement the mitigation measures, as identified in Table 1, Summary of Mitigation Measures; and
- Monitor its own and its subcontractors' maintenance activities to ensure that the mitigation measures are being properly implemented.

In addition, the City will:

- Provide oversight and guidance to LARPD in implementation of the SMP;
- Oversee and ultimately be responsible for implementation of all compensatory mitigation activities, including mitigation that is required for impacts associated with LARPD maintenance activities;
- Evaluate the effectiveness of mitigation activities consistent with the reporting and monitoring schedule described in the column Implementation and Reporting Schedule in Table 1; and

- Accurately report its activities, along with those of LARPD, to the regulating authorities described in the SMP.

In addition, LARPD will:

- Accurately report its activities to the City for inclusion in the City's reporting documentation to the regulating authorities described in the SMP.

3.0 Table 1 – Summary of Mitigation Measures

The MMRP for the SMP is presented as a table that includes the mitigation measures identified in the IS/MND. The City may refine the means by which implements a mitigation measure as long as compliance is achieved during project implementation.

3.1 Description of Table Headers

The MMRP describes implementation and monitoring responsibilities, timing, mitigation and reporting schedules, and implementation mechanisms or tools for each mitigation measure identified in the IS/MND, as described below.

Mitigation Measure: Provides the mitigation measure as identified the IS/MND.

Implementing, Monitoring, and Reporting Responsibilities: Identifies the entity that will be responsible for directly implementing the mitigation measures, reporting, and monitoring. Long-term mitigation responsibilities separate from implementation of maintenance activities will be held by the City.

Mitigation Timing: Implementation of mitigation will not all occur at the same time. Depending on the mitigation requirements, it may be undertaken prior to maintenance, during maintenance, or following maintenance. These columns identify the stage(s) of the project during which the mitigation will be implemented and when reporting is to occur, if it is required.

Mitigation and Reporting Schedule: This column describes when the mitigation will be implemented and when reporting is to occur.

Implementation Mechanism or Tool: Identifies the actions required to implement the mitigation measure, including any required agency consultation, documentation, agreements and/or conditions.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing			Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Maintenance	During Maintenance	Post-Maintenance		

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing			Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Maintenance	During Maintenance	Post-Maintenance		
Livermore SMP Impact Reduction and Minimization (Livermore SMP Chapter 7) This chapter describes the best management practices (BMPs) that will be applied to pre-maintenance planning and implementation of maintenance activities. These BMPs were identified and developed to protect the natural resources and the Beneficial Uses of the creeks and channels within the SMP Area. These BMPs address the following topics. • General impact avoidance and minimization • Air quality • Biological resources • Cultural resources • Construction and seismicity • Hazardous materials safety • Vegetation management • Water quality and creek/channel protection • Good neighbor policies	**Implementing Party:** City or LARPD **Reporting Party:** LARPD to City; City to regulatory agencies **Monitoring Party:** City or LARPD	X	X		**Implementation:** The party implementing a given maintenance activity (either the City or LARPD) will also implement BMPs associated with the activity as identified in the annual work plan. **Reporting:** The results of surveys associated with BMP implementation (e.g., species surveys) will be reported to the City if conducted by LARPD, and the City will report to regulatory agencies as required by the BMP. Any issues related to implementation of BMPs will be included in the annual report, and discussed with regulatory agencies.	Development of the annual work plan, and associated notification package to the regulatory agencies, will identify the applicable BMPs in advance of project work. BMPs will be implemented as stated in the final and approved notification package to regulatory agencies.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing			Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Maintenance	During Maintenance	Post-Maintenance		
Livermore SMP Mitigation Program (Livermore SMP Chapter 8) This chapter provides a summary of compensatory mitigation required to address residual impacts that remain after the application of the BMPs described in chapter 7. The mitigation approach follows a three-tiered approach where impacts are preferably mitigated within the same reach as impacts occur, and if that is not possible, within other SMP Area reaches. Mitigation ratios are identified for permanent and temporary impacts for waters of the U.S., riparian vegetation, and for focal species as identified in the SMP.	**Implementing Party:** City **Reporting Party:** City **Monitoring Party:** City	X	X	X	**Implementation:** As required, the City will design and construct any necessary compensatory mitigation for impacts to waters of the U.S. and state, riparian vegetation, and focal species per the terms of the approved notification package. **Reporting:** A summary of activities conducted each maintenance season, including compensatory mitigation as implemented, will be compiled into an annual report, and provided to the regulatory agencies for review and discussion.	Development of the annual work plan and associated notification package to the regulatory agencies will identify the applicable compensatory mitigation for impacts to waters of the U.S. and state, riparian vegetation, and focal species in advance of project work. The proposed compensatory mitigation will be implemented as stated in the final and approved notification package to regulatory agencies.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing			Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Maintenance	During Maintenance	Post-Maintenance		
Mitigation Measure BIO-1: Springtown Alkali Sink Preservation, Restoration, and Management If impacts to the valley sink scrub habitat within the Springtown Alkali Sink cannot be avoided, the City shall restore or create valley sink scrub habitat at a ratio of 2:1 (mitigation to impact) for permanent impacts within the greater Springtown Alkali Sink area with preference for habitat adjacent to the existing Springtown Alkali Sink Preserve. All mitigation lands also will be preserved.	**Implementing Party:** City **Reporting Party:** City **Monitoring Party:** City		X	X	**Implementation:** As required, the City will design and construct any necessary mitigation for impacts to valley sink scrub habitat within the Springtown Alkali Sink Preserve per the terms of the approved notification package. **Reporting:** A summary of activities conducted each maintenance season, including mitigation for impacts to valley sink scrub within the Springtown Alkali Sink, will be compiled into an annual report, and provided to the regulatory agencies for review and discussion.	Development of the annual work plan, and associated notification package to the regulatory agencies, will identify the applicable mitigation for impacts to valley sink scrub habitat within the Springtown Alkali Sink Preserve in advance of project work. The proposed mitigation will be implemented as stated in the final and approved notification package to regulatory agencies.